AVIATION

The Oldest American Aeronautical Magazine

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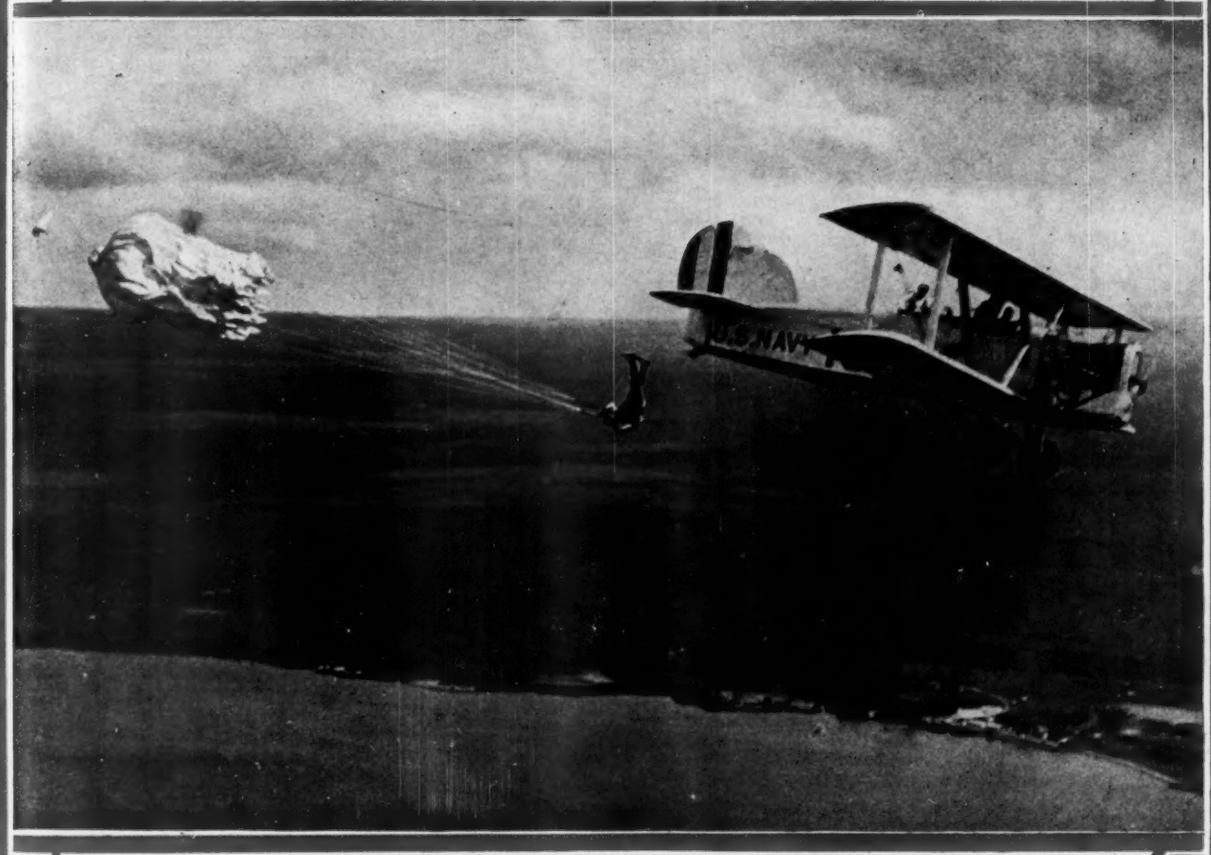

The Thrill of the Parachute

P. & A. Photos

VOLUME XIX

NUMBER 19

SPECIAL FEATURES

AIR TRANSPORTATION FACTS

THE MERCURY JR. COMMERCIAL PLANE

MORE DISCUSSION ON BOMBING ACCURACY

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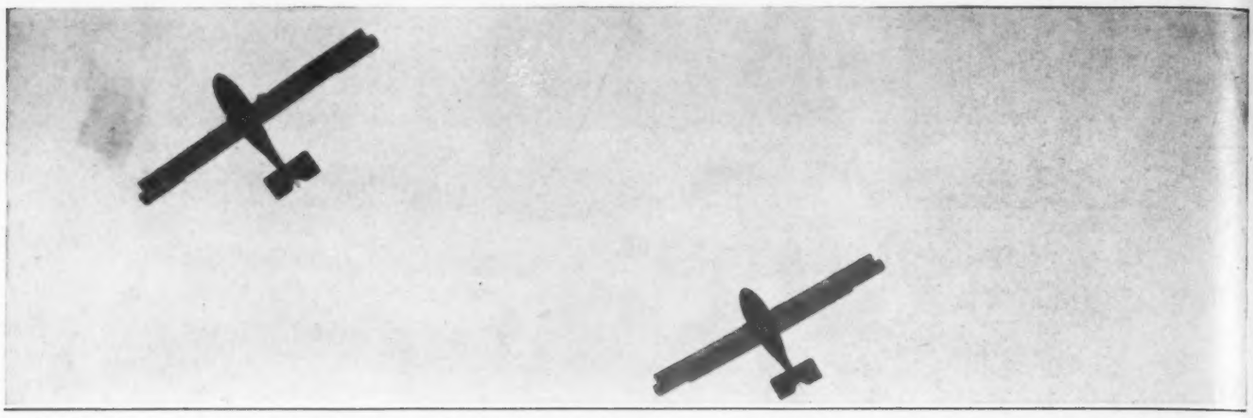

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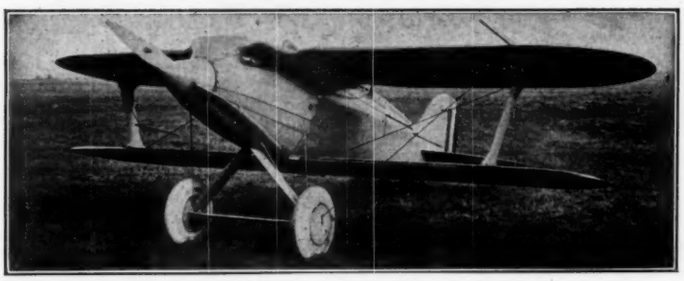

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NOVEMBER 9, 1925

AVIATION

VOL. XIX. NO. 19

Published every Monday

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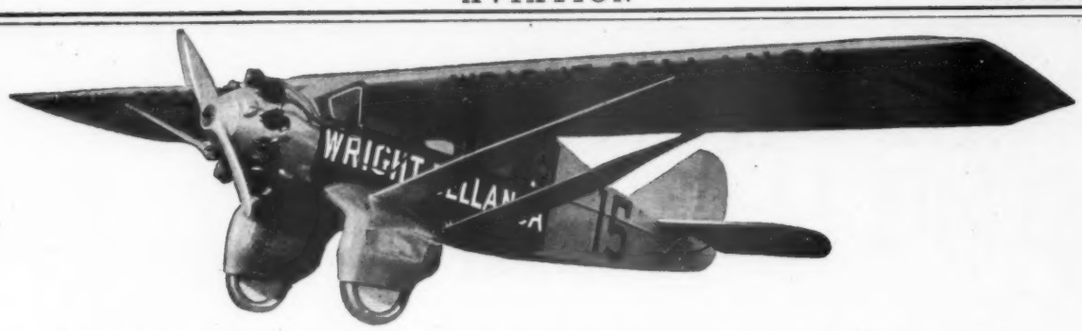

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Orders for Wright-Bellanca planes are being taken now for deliveries early in the spring. The price complete with Whirlwind engine is $12,000 f.o.b. Paterson.

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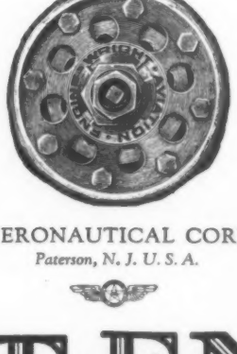

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VOL. XIX NOVEMBER 9, 1925 No. 19

An Air Force—A Political Issue

ONLY those who take a narrow view of the aviation controversy fail to see behind the discussion the possibilities of a political issue. That the country has lost confidence in the present organization and management of our military and naval establishments is evident from the editorials in newspapers, the applause at moving picture houses when pictures of air champions are shown, and lastly from the "Man in the Street." It is not too much to say that the whole structure of national defense has been shaken to its foundation.

Heretofore, the Army and Navy have had well defined missions. The country has gladly given its wholehearted endorsement to its military and naval leaders. Appropriations have not been all that were desired but have been large in recent years. But, gradually, air power has altered the strength of the older arms until now the people are bewildered and question the utility of some of their older safeguards.

With public opinion uncertain, leadership becomes essential. If President Coolidge seizes the helm and steers a true course, the country will become satisfied. But a vascilating handling of the whole problem of National Defense will inevitably throw it into the political arena. It must be remembered that there are few real political issues that can arouse public interest. Here is one that has every element of controversy. This danger alone should make those charged with framing a government air policy seek to avoid making it a political football.

The Loss of the Navy's Seaplanes

THE WIPING out of a squadron and a half of our most modern naval three purpose type seaplanes is a disaster of such magnitude that it should be most carefully investigated and the causes ascertained. The Navy has suffered from a series of disasters that arouse sympathy, but as the accident which took place at Baltimore will probably be used as an argument to show the frailty and unreliability of aircraft, the matter cannot be passed over in silence even though it may seem somewhat like hitting a man when he is down.

A sixty mile gale arising from an unexpected quarter may well be considered as "An Act of God" and the disaster excused as absolutely unavoidable. The storm was certainly of extraordinary violence and caused damage to property and loss of life throughout the country, but it cannot be admitted that such a storm will necessarily wreck any fleet of seaplanes that happens to be anchored in its path. Rodger's fleet of five civilian flying boats were moored out at Baltimore during the storm. One out of the five broke loose from its moorings but was saved by the energetic action of its crew before serious damage was sustained.

Among commercial pilots it is generally agreed that if a plane breaks loose while on the ground that the pilot is responsible for the accident. A plane properly moored will not break loose, but the proper mooring requires both experience and proper mooring gear. The Aero Marine Airways lost two F5L's during its first three months of operation due to their breaking loose from moorings. During the next three years of operation only one was damaged from this cause.

There are several essential practises in the mooring of seaplanes, such as allowing sufficient slack to prevent sudden jerks; protection, to keep the ropes from chafing through, etc. Some of these have been long known to mariners others are peculiar to aircraft, but once these are understood there is no more excuse for a seaplane draging its anchor or parting its moorings than there is for a fleet being driven ashore by a violent blow.

Learning by experience is a bitter method, and our sympathy goes out to the naval air service in their loss of so much modern equipment, but it is hoped that it will not be assumed from the mishap that aircraft will nececsarily break loose during a strong wind.

The Mitchell Trial

FOR THE first time since the war, it seems probable that the best informed aeronautical experts and government officials will be put under cross-examination by well informed questioners who seek to bring out the underlying facts of American aviation.

Heretofore, the hearings have been before boards or committees composed of members whose aeronautical information was gained largely from what they heard at the enquiry. With one or two exceptions, all the questioning was done by men unacquainted with even the most rudimentary facts of aeronautics. With ex-Gen. Mitchell fighting for his reputation and his career, there will be less tendency to let witnesses tell what they want to say and avoid giving information about the subjects that are controversial. The true situation regarding our air strength is now likely to be given to the public.

Every Week's News

FOR THE past few months there has been such a volume of aviation news that it has not been possible for AVIATION, even though a weekly, to publish a fractional part of what has been said or done. It has had to be contented with giving the final results of many of the happenings with an interpretation of the effect on American aviation. With accidents, trials, hearings, races, and the visits of foreign aeronautical visitors, the aeronautical news has been enough to fill a daily publication instead of a weekly.

Captain Carolin on Bombing

Replies to Criticism of 80% Hits—Explains Bombing Theory

Shortly after Capt. Norbert Carolin's letter on bombing appeared, many letters were received regarding his claim of 80% hits. The most interesting was from Maj. B. W. Simpson of the Ordnance Department, which gave the results of the recent experiments in the field. The following letter was received from a correspondent and forwarded to Captain Carolin and is printed with his reply.—ED.

Editor, AVIATION:

Your head line, "Bombing with 80 per cent Hits," in a recent issue of AVIATION caught my eye.

Knowing the very important part the bomb sight plays in the accuracy of bombing, I turned the pages of your magazine in eager anticipation of reading of some wonderful new development in bomb sights—bomb sight design and development having had a large share of my time for the last five years.

What was my disappointment to find nothing but Bombing Opinions and "Banana Oil." How many pounds of bombs your correspondent dropped or did not drop does not necessarily qualify him in the least. Personally, I have done my bit of flying, but never dropped anything more than an apple core over the side.

What were your correspondent's percentage of hits? And from what altitudes? And what size of target? Of course the inference is 80 per cent from 9000 ft. Efficiency of this order is highly desirable. Perhaps that is why those engaged in this work are never out of school, and so much time and money is being spent in perfecting the bomb sight.

No one will deny the effectiveness of high explosive detonated under water near the side of a battleship. The problem is to place it there from an altitude of 9000 ft. more or less, which your correspondent entirely ignores.

Such *effective* hits as have been made in practice were from altitudes altogether too low for the safety of the bomber in actual warfare.

In my humble opinion the two articles in the *Saturday Evening Post* of May 13 and 30, are the fairest statement of facts on both sides that have ever been published.

Very truly yours,
MORTIMER F. BATES

Reply by Norbert Carolin

It would be an easy matter to reply to this letter by saying that the Air Service pilots in Panama found ripe tomatoes more efficatious than apple cores in bombing the U.S.S. Langley, and by suggesting that castor oil might possibly be found more efficient than banana oil, but to indulge in facetiousness and personalities in a subject, so intimately connected with our national defense as is aerial bombing, would hardly seem proper. However to fail to seize this opportunity for further discussion of this important subject would be quite impossible.

No doubt every individual in the service of our country sincerely believes that his particular branch is of far greater importance than any other, and this is as it should be, as it is indicative of good morale which is even more to be desired than good bombing. However, such belief should be based on sound facts and, until facts are presented to the contrary, those connected with bombing will continue to believe that no method of warfare has ever been developed that is as efficient as aerial bombardment when its mobility, accuracy, destructive effect and cost are considered.

For instance compare long range artillery fire with aerial bombardment. What gun, either ashore or afloat, can be moved 1000 mi. in a day, or has a range of 400 mi., or has the same accuracy as bombing at even 30 mi., or whose projectile contains 50 per cent of explosive and costs only 50 cents a pound? What pilot, who has flown over a Coast Artillery battery for hours waiting for firing to commence, and then observing the flash a thousand yards from the target, has not wished that his plane were equipped with bombs to destroy the target and have the whole thing over with? Here note that the bombing plane needs no observation plane to spot its hits.

Then too there is the very important fact that the bombing plane always takes the offensive, due to its extreme mobility. Hence it can choose the most advantageous time and direction of attack, and by taking advantage of darkness, altitude, clouds, smoke screens and the blinding glare of the sun, nullify the anti-aircraft defense. In this matter of anti-aircraft defense, the point seems to be generally lost sight of, that a hit on a plane does not signify that it is brought down. Instances have been recorded during the World War, of planes returning to their airdromes literally shot full of holes. Hence the "constructive hits" in the recent anti-aircraft tests would probably be of no consequence.

Bombing an Exact Science

There would probably not be so much controversy regarding bombing if it were generally known that the tremendous amount of data collected has practically reduced it to an exact science. Take in the matter of bomb design for instance, there are bombs designed for almost any conceivable purpose. First there is the 25 lb. fragmentation bomb for use against personnel. It has a radius of action of 200 ft. and would probably wipe out an infantry company in close order. Tests indicate that it has a greater destructive effect than any artillery projectile of the same weight and its fragments have a higher initial velocity than the fastest rifle bullet. Records of the Medical Dept. show that a greater percentage of fatalities result from bomb fragment wounds than from any other wounds.

Then there are the demolition bombs weighing from 100 to 4300 lb. and intended for use against objectives ranging from submarines, to battleships and from railways to canal locks, and fortifications. As an instance of their destructive effect it might be mentioned that the 4300 lb. bomb makes a crater in the earth 30 ft. deep and 100 ft. outside diameter. The 2000 lb. bomb would very probably sink any battleship afloat if dropped within 50 ft. of the hull.

In addition there are the gas bombs. The phosgene bomb causes instantaneous death and the mustard bomb causes casualties for several days in the area in which it is dropped. Also there are other types of bombs such as phosphorus bombs for laying down smoke screens. No special type of bomb is used for incendiary purposes as all bombs are more or less incendiary in effect.

Misconceptions Corrected

Right here it would be well to correct several popular misconceptions regarding bombing.

First, there is the impression that a moving target such as a battleship could "dodge" a bomb. Ask any naval constructor if the center of gravity of a battleship could be moved a hundred feet off its course in 25 sec., the time it takes a bomb to fall 9000 ft.

Second, there is the impression that a moving target is more difficult to hit than a stationary one. The reverse might be true with a properly designed sight, as the sighting interval would be longer when flying in the same direction as the target.

Third, there is the impression that there is only one point, at a given altitude at which a bomb can be released to strike a given target. Such is by no means true, as the locus of releasing points is a circle the center of which is upwind from the target, and by changing the airspeed of the airplane this circle can be expanded to a broad band.

Fourth, there is the impression that bombing at low altitudes is much easier than higher up. As a matter of fact, under 3000 ft. the sighting interval is so brief that it is sometimes difficult to adjust for "line" and "range," and when

bombing under 1000 ft. the bomb will not strike "head on" but will sometimes go galloping merrily along.

In conclusion would say that it is my firm belief that aerial bombardment will be a great peace-maker in that it brings the war right home to the war-makers.

Reply to Dr. Loring

Without doubt, Dr. Loring's statement that 25 per cent hits may be expected on a battleship from an altitude of 9,000 ft. is, as usual, founded on exact data. This percentage is considerably at variance with the 3 per cent mentioned in the articles in the *Saturday Evening Post* and it now appears to be clearly up to the Assistant Secretary of the Navy, or whoever wrote the articles, to acknowledge his mistake on this point and possibly on the other five points criticized. These latter I take to be correctly stated in my article as they have brought forth no comment.

In my previous article it was not intended to bring out just what particular percentage of hits could be expected. I merely knew from experience that the 3 per cent criticized was too small and I could not let it pass unchallenged. Possibly, I over estimated the amount of improvement that has been made in the art of bombing during the four years I have been out of the service. At that though, I see no reason why the "25 per cent" bombers should not be returned to school for further training until they attain the 53 per cent class.

At any rate my article has created a much needed discussion of a very important subject, and has brought out exact data on same, presented by a recognized authority which I do not claim to be. Hence my little effort has not been in vain.

May I take this opportunity to suggest some improvements in bomb sighting that may possibly reduce some of the errors mentioned by Dr. Loring.

1st—That the bomb sight be stabilized. (I believe Dr. Loring has already accomplished this.)

2nd—That the front sight be synchronized with the target, thereby eliminating the determination of the ground speed or wind speed, also eliminating the necessity for a supplementary aiming point, and permitting the bombing of a moving target as readily as a stationary one. (Further elucidation of this point follows later.)

3rd—That the bomb-sight stabilizer also stabilize the airplane, through servo-motors and clutches.

4th—That the sighting bar steer the airplane in the same manner. This method would probably involve a "direction stabilizer."

Of course the clutches mentioned above would be attached to the airplane controls via shock absorber cable so that the pilot could regain control at any time.

As regards the synchronized front sight mentioned above, first let us consider a vertical cube of uniform, still air, with a bombing airplane "A" flying along an upper edge, and a target "T" in the lower surface of the cube and moving at any angle and velocity relative to the line of flight.

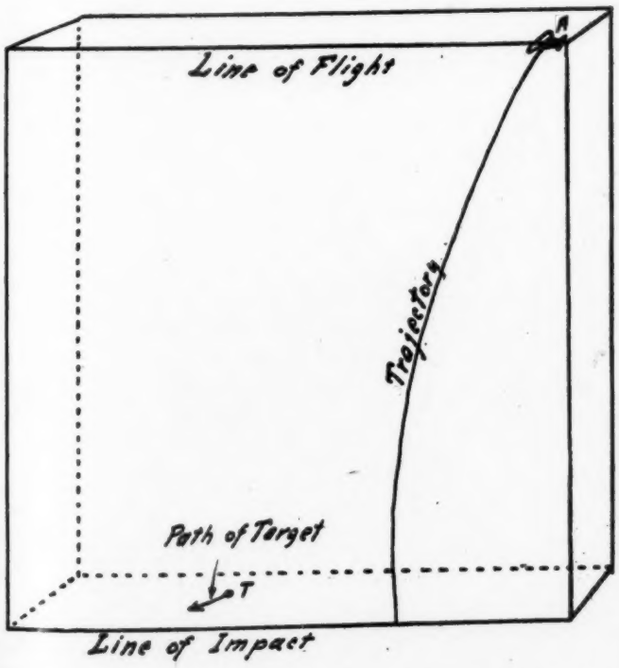
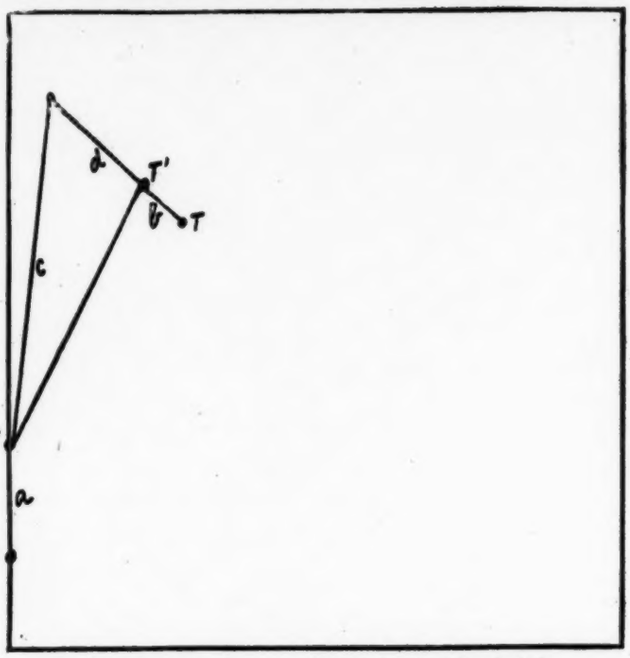


Diagram Illustrating the use of the Synchronized Sight



Further Illustrating the use of the Synchronized Bomb Sight

In this discussion we will utterly ignore the earth's surface, as it is absolutely immaterial whether the target be an airship at constant altitude, or a moving vehicle, or a vessel under way, or a stationary object on the ground. As a blimp, headed into the wind, with an airspeed equal to the wind speed, would hover over a stationary object on the ground, we may speak of the speed of the wind as the airspeed of the stationary object. Hence we are concerned only with the relative direction and airspeeds of the airplane and target.

It is further assumed that the usual variables such as "bomb dispersion," inaccuracies in the instruments, etc. are ignored for the present and that the airplane is headed in the general direction of the target.

At a given altitude, a given air speed, and with a given type of bomb, we know that the impact of the bomb will be at a centain definite point "P" on the lower edge of the cube. A series of bombs would mark a line we will call the "line of impact." Our problem then resolves itself into the determination of the relative direction and velocities of the moving points "T" and "P," and correcting our "line of impact" (sic) so that it converges with the path of the target and the two points arrive simultaneously at the same point, at which moment the bomb is released.

Referring to the plan view of the cube, let "a" and "b" equal the distances that points "P" and "T" traverse in any interval of time, the distance "a" being given by the airspeed indicator. Then the sight must automatically construct a triangle such that "a" is to "b" as "c" is to "d". Hence "c" will be our corrected "line of impact."

Of course point "T" does not appear to the bomber to be moving in the direction shown in the sketch, as the airplane is moving faster than the target, also the airplane does not revolve around point "P'", instead this rotates as the airplane revolves. These are points, however, that can be readily taken care of in the sight. In a synchronized sight, the target is not observed at intervals but continuously and the line of flight is continuously corrected if the airplane yaws.

The Organization of the French Air Services

Technical Development and Procurement for Army and Navy Administered by Separate Department.

IN France there are three departments which are concerned with the handling of aeronautical affairs; the War Department, the Navy Department and the Colonial Department but actually there is a fourth department; that of Public Works which has so much to do with the management and guidance of aeronautical matters that it might be considered as a partial development of a separate air department. In January, 1920, Mr. Pierre Etienne Flandin was appointed Under Secretary of Aeronautics and Aerial Transportation, a post which had been created as a branch of the Department of Public Works. This Under Secretary is responsible for technical development and the procurement of aircraft for the army, navy, the colonial department and the civilian air transport lines. He also has under his control all government arrangements with civil aircraft transportation concerns and the branch of the meteorolgical department which concerns aeronautics. He does not control the army and navy air personnel nor the development of air tactics, but his other functions are so important that he holds a predominant and centralizing influence in French aeronautics.

The Aeronautics Secretariate

The organization of the Under Secretary for Aeronautics is divided into four principal branches. One has to do with technical development and experimentation, another is concerned with manufacturing and production, while a third has to do, broadly speaking, with airways and landing fields and the arrangements of the government with the private companies. Lastly, there is the department of meterology.

The 'Service Technique' is, itself, divided up into two parts, one for research—'Service des Etudes'—and the other for testing—'Essais et Experiences'. The director of the technical branch thus coordinates the theoretical research and its practical application. The research department is divided up into numerous sections dealing with airplanes, flying boats, lighter-than-aircraft, engines, propellers, navigation, ornament and special appliances such as radio, cameras, shops, etc. The testing branch has a research section and a laboratory section which controls the aeronautic laboratories of Issy-les-Moulineaux, Eiffel, the Institut Aerotechnique de St. Cyr and Chalais-Meudon. Also a testing section with its field at Villacoublay, and an information section and, finally, a museum section, come under this branch.

The Production Branch

The manufacturing and production branch—'Service des Fabrications de l' Aeronautique'—arranges for the civilian manufacturers to furnish and, in certain cases, repair, all the material used by the government, such as planes, flying boats, float seaplanes, hydroplanes, balloons, engines, hangars, raw materials, trucks, radio, etc. This branch draws up the contracts for production orders but not for experimental work and pays for the material. It supervises the quality of the work done in the factories; it accepts the material and conducts the flying tests of the finished planes and sees to packing and shipping where this is necessary. Lastly, it is charged with laying out a scheme for the rapid development of manufacturing facilities in case of war, provisions being made for factories to take care of each special type. It is further charged with the keeping of the blue prints models, etc., which are used in production.

Civil Aviation Department

The third great branch is that concerned with airways—Service de la Navigation Aerienne'. This branch plans, figures out the most useful airways, does the necessary reconnaisance work, buys and arranges the landing fields, builds the hangars and erects the radio station, etc. It makes and follows up the contracts with the air transport companies, arranges the subsidies, grants the medical licenses to the pilots and grants pilot licenses of various classes. All the airdromes in France, Corsica and Northern Africa, as well as the radio, come under this airways department.

The fourth branch is that concerned with meterology—L'Office National de Meteorologie which, as its title indicates, gathers and gives out information about the weather.

The personel of the main bureau of the Under Secretary for Aeronautics and the four associated branches, are made up of civilian personel, as well as of military personel, detached from the army or the navy. A law of March, 1924,

The Nieuport 29C Pursuit Plane of the French Air Service

authorizing the creation of a corps of civilian engineers attached to the aeronautical branch has been recently fulfilled, and the principal official technical men are now "Ingeniurs de L'Aeronautique". There are also a certain number of consultation committees which function intermittently on technical, medical and meteorological matters.

Military Aeronautics

In the war department most of the questions touching on Aeronautics are handled by the XII bureau—'XII Direction'. The aviation bureau or section, of the war department is autonomous as far as its internal management and the advancement of its personel is concerned, and is separated from the other branches of the service. However, the general staff of the war department is in charge of the tactical uses of the air forces, of the number and location of aeronautical units and of the fixing, each year, of the new personnel to be assigned to aviation. The Quarter Master Corps furnishes barracks, the Powder Section furnishes gasoline and oil and the Artillery furnishes special arms, bombs, anti-aircraft and standard ground transportation material, etc. As has been stated before, aeronautical material, flying equipment and special aeronautical equipment is purchased by the Under Secretary of State for Aeronautics, according to the decisions and requirements of the "users services", the 'XII Direction', for example.

The 'XII Direction' is thus essentially concerned with organization, instruction and mobilization. It creates questions of reserves, personnel, general organization and information. There is a section for heavier-than-air, a section for the budget and for settlements and a fourth section, which deals with effective personnel.

Inspection Department

The bureau of general inspection of military aeronautics—'Inspection generale de L'Aeronautique Militaire' created in 1921, functions independently of the 'XII Direction'. Its purpose is to inform the ministry and the general staff of the development of aviation, to insure a unity of policy among all the troops and to study anti-aircraft defense.

There are several sections, which come under the control of the 'XII Direction'.

(a) A technical section for the inspection of military aeronautical material—'Inspection Technique de l'Aeronautique'—whose function is to control, from the technical point of view, the establishments and formations of military aeronautics, watching the upkeep of material, examining technical suggestions coming from the various formations and following the development of new devices in actual use. This section is in very constant and close touch with the technical branch, which comes under the Under Secretary for Aeronautics.

(b) A supply section—'Direction Generale du Ravitaillement en Materiel del'Aviation', which coordinates the various warehouses and effects the storage and distribution of aeronautical material.

(c) A central warehouse—'Entrepot Central de Materiel del'Aerostation Militaire'.

(d) A school section—'Écoles'. There is only one primary training school for military pilots, namely that at Istres. Due to the difficulty of training pilots during the period of their compulsory service, the war department entrusts the primary training to civilian schools where the training is done before the recruits have done their compulsory service. At Cazaux there is a machine gun and bombing section. At Bordeaux there is a school for mechanics, riggers, etc., while the lighter-than-air section is at Cosne and the anti-aircraft at Montargis.

(e) The Meteorological Section is identical with that of the National Meteorological bureau.

(f) A central advanced school of aeronautics for officers located at Versailles.

Military Groups

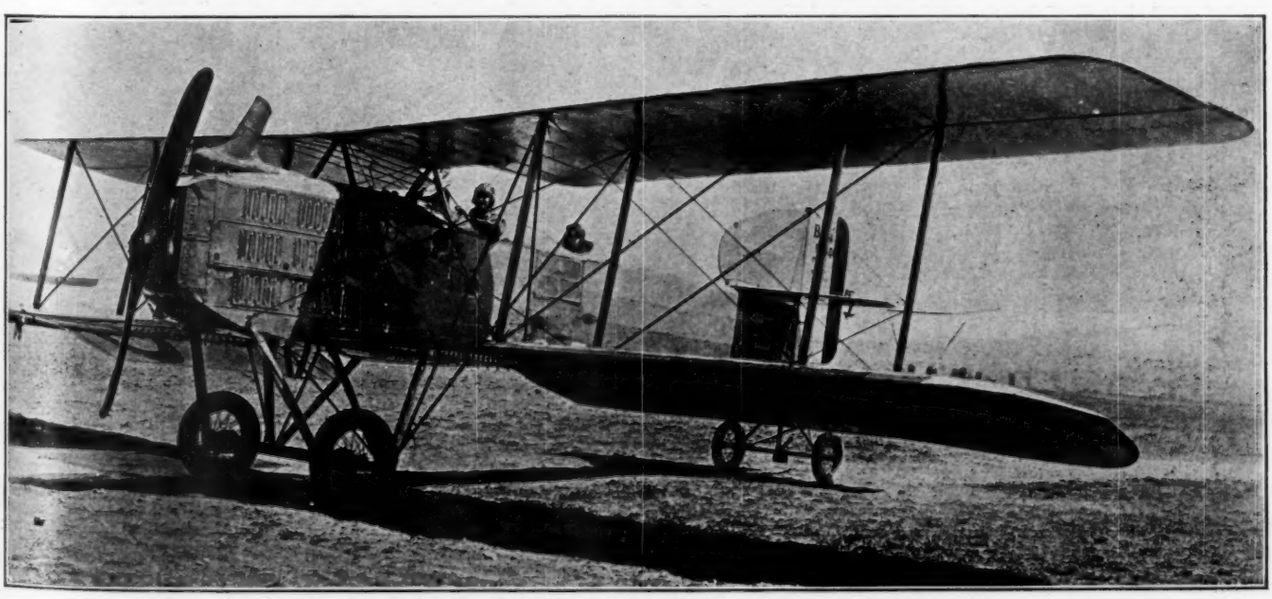
There are two pursuit regiments, two day and two night bombardment regiments and nine observation regiments and the following types of planes are used:

Pursuit types, Nieuport 29 and Spad 81, both with 300 hp. Hispano Suiza engine. Bombardment types, Breguet 14 B2 with 300 hp. Renault and the Breguet 19 B2 with 400 hp. Lorraine or 480 hp. Renault engines. Night bombardment types, Farman Goliah BN2, with 200-300 hp. Renault or 200-260 hp. Salmson. Observation types, Breguet 14 A2 with 300 hp. Renault, Potez XV with 400 hp. Lorraine, Breguet 19 A2 with 400 hp. Lorraine or 480 hp. Renault.

Naval Aeronautics

Naval aeronautics has been undergoing very important modifications in its organization during the past year as the secretary of the navy has found it expedient to give aeronautics a more prominent position. The manner of handling naval aeronautics was changed by a decree of the Navy department, passed in November, 1924, and there is a bill now before parliament, which will put naval aearonautics on more or less the same status as army aeronautics, especially in regard to personnel questions.

Actually the central bureau of aeronautics is divided into two divisions, a technical and administrative division, which handles questions of material and personnel, and a military division, which handles the questions of tactics, training and mobilization. A decree of Jan., 1925, modified the defense of the sea coast and has restored to the maritime prefects, their former functions. In each district there is a corresponding aeronautical district of either primary or secondary importance and containing training bases, bases for maneuvers and one or more storage bases.



The French Breguet 14B type Bombardment Plane

Clymer Manufactures New Automatic Tire Gauge

Floyd Clymer, Denver Manufacturer, original builder of the Clymer Windshield Spotlight, is now manufacturing a new and distinctive type of tire gauge.

The new invention was recently patented in the United States and Canada and differs materially from all present types of air gauges, in view of the fact that it determines the amount of pressure as the tire is undergoing inflation, instead of after the tire has been inflated.

The instrument, known as the Clymer Automatic Air Gauge, is highly developed and very carefully and accurately made. It is carried either in the pocket or in the tool kit, and, when inflating a tire, is attached between the tire valve and the air hose, so that the air passes through the instrument as it enters the tire.

Before inflating, the user simply adjusts the thumb screw indicator to the amount of pressure desired in the tire, attaches the instrument by pushing on the tire valve stem, and then applies the hose to the instrument.

The hose, once applied, is never removed until the proper pressure has been reached, and when this occurs the gauge not only automatically shuts off the supply of air, but warns the user by sounding a whistle, which is a part of the instrument.

Even if the hose were to be left on the gauge for hours, no additional pressure beyond the amount desired could enter the tire, and the whistle would sound until the hose was removed.

Other type gauges require several different readings, usually, and attaching and detaching the hose several times before the correct amount of pressure has been inserted, while the new Clymer gauge takes care of the proper amount by one attaching of the hose. The instrument is packed in a small leather pouch, and weighs but four ounces complete. It is highly nickeled and polished, four inches in length and very neat and compact.

It is carefully made of high grade materials, brass tubing being used to house the working parts, which include a carefully calibrated spring, a brass cylinder and a piston of nickel silver which the action of the air causes to slide over small intake and exhaust ports.

It is claimed to be the most accurate indicator of air pressure on the market and retails for $2.50, for either balloon or high pressure types.

An intensive sales campaign has been started and the new gauge seems to meet with enthusiastic and instant approval wherever shown and authorities, who have inspected the instrument, predict that it may soon have nationwide sales appeal to motorists.

Production has already started and the company, known as the Clymer Motor Products Company, located at 1526 Lincoln Street, are already making shipments to eastern points and are rapidly arranging for national distribution.

The instrument is also likely to become of very considerable value to constant users of airplanes for touring and commercial traveling work when compact, complete and easily accessible tools are essential.

United States Civil Service Examination

The United States Civil Service Commission announces the following open competitive examination for the position of Junior Aeronautical Engineer.

Receipt of applications for junior aeronautical engineer will close Nov. 14. The date for assembling competitors will be stated on the admission cards sent applicants after the close of receipt of applications.

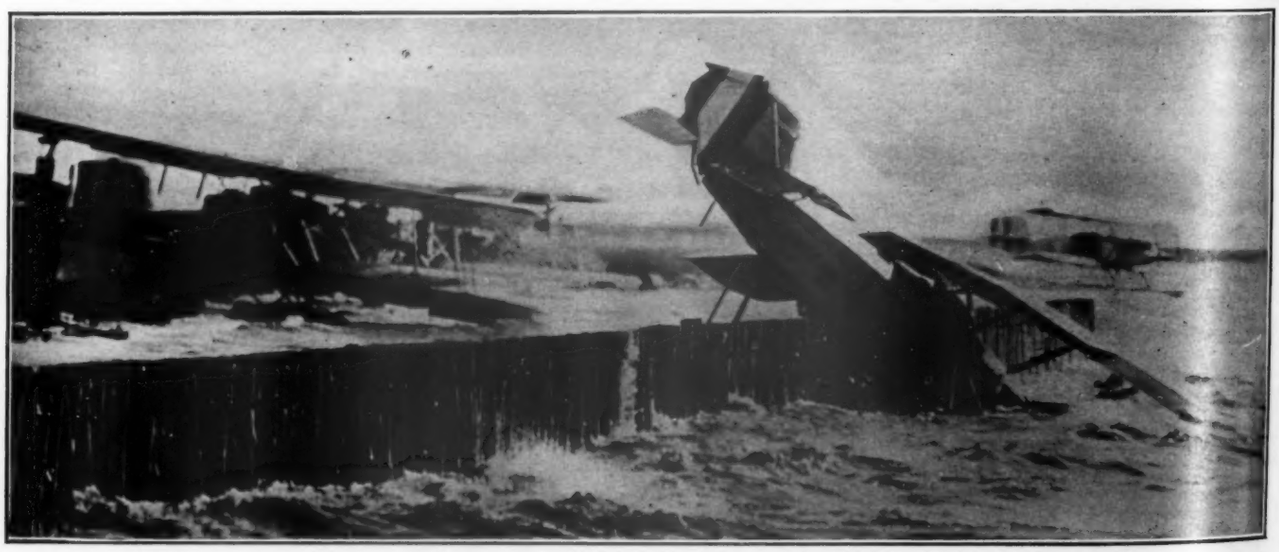
The examination is to fill vacancies in various branches of the Government service throughout the United States. Several vacancies in the War Department at McCook Field, Dayton, Ohio, will be filled from this examination.

The entrance salary in the District of Columbia is $1,860 a year. After the probationary period of six months required by the civil service act and rules, advancement in pay may be made without change in assignment up to $2,400 a year. For appointment outside of Washington, D. C., the rates will be approximately the same. Promotion to higher grades may be made in accordance with the civil service rules.

The duties of the position consist of such work as routine testing, inspection of engineering material, performing field work, preparing maps, making computations, compiling reports, handling technical correspondence, and other related work.

Competitors will be rated on general physics; pure mathematics; practical questions on aeronautical engineering, including applied mechanics; and education, training, and experience.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil service examiners at the postoffice or customhouse in any city.



The Seaplane Disaster at Baltimore. Seventeen C.S. planes out of two squadrons of twenty-three, were blown from their moorings during the Baltimore Schneider Cup Meet. The gale was blowing seventy-five miles per hour and the new seaplanes were piled up on the shore by the wind. While some of the wrecked planes can be salvaged many are a total loss, as will be seen from the picture above.

Frontier Facts in Air Transportation

Results of World Investigation Reveal Tremendous Future

By LIEUT. J. PARKER VAN ZANDT, U.S.A.

The following article is reprinted through the courtesy of the Journal of the Society of Automotive Engineers, which also loaned the illustrations from the October issue.—ED.

MARK TWAIN once defined a newspaper as "a small body of information entirely surrounded by advertisements." Similarly, aeronautics might be described as a small body of facts entirely surrounded by opinions. Indeed, we might go further and say "almost entirely obscured by opinions," for surely the air transportation field today is surfeited with prophetic visions, panaceas, and all manner of talk, while the bed-rock of facts, the only safe foundation for rational thinking, is being sadly neglected. Perhaps what we need most in commercial aviation is to stake out the frontiers of this body of authentic, undisputed facts; we need to know what is solid ground.

Rational opinion is the interpretation of facts in the light of sound judgment and experience. It starts from the known and predicts the future by a process of conservative extrapolation. The known facts are the bricks. The mortar that unites the bricks in a useful structure is the trained intelligence that brings to the task the best of critical perspective and experience; but we cannot begin to build until we have the bricks.

Experience Necessary

Where can we find the facts There is only one source—actual experience. The accumulated experience of the air-transportation ventures of the world is the factory in which these "bricks" have been and are being made. It is the laboratory of the air-transportation engineer. Our task, then, is to isolate and label the facts developed in this laboratory.

The four accompanying charts are an attempt in this direction. Fig. 1 is a graphical picture of the extent of the air-transportation "laboratory." More than 28,000,000 miles has been flown in Europe and the United States to Jan. 1, 1925, in regular scheduled air services. These 28,000,000 miles represent the primary source of operating facts.

Six Years Air Transport

Fig. 2 is a graphical picture of the world experience in air traffic. In six years more than 51,000,000 lb. has been carried by aircraft over established routes. A careful analysis of this experience will give us the body of facts we so much need regarding the air traffic problem.

Thus, Figs 1 and 2 give a bird's-eye view of the sources of our facts, while Figs. 3 and 4 suggest some of the basic facts that a study of these sources will disclose. No claim is made for their completeness. They are set down as indicative of the character of research that must be carried out if we are to separate the authentic lessons of experience from the welter of ungrounded opinion. They represent only a beginning in this work of scientific fact finding.

The Optimistic Outlook

It may be well to include a caution against indiscriminate conclusions from the facts on safety and reliability shown in Figs. 3 and 4. They are *selected* facts and a knowledge of the conditions of operation under which these experiences accrued is essential to their proper interpretation. This knowledge is the "mortar" referred to in the foregoing analogy; it is the factor of personal perspective and understanding that determines the value of an opinion, apart from the facts upon which it is based. Granting, however, that these are selected facts and hence only a partial picture, they form a hopeful basis for holding an optimistic view regarding the ultimate future of air transportation.

If this brief statement serves to stimulate others to attack the aeronautical problem in a spirit of impartial fact-finding, it will have amply served its purpose. Commercial aviation is starved for facts, but fortunately most of the information vitally needed is available in the world if enough trained and willing workers can be enlisted to collect it and present it intelligently.

An opinion that does not carry with it an essential agreement with all the available facts is like a taxicab without a passenger; in the words of Christopher Morley, "It is only the taxi with a fare inside that spins briskly to its destination."

Summary

The appended summary of Mr. Van Zandt's investigation analizes the following figures and serves to form a compact review of the essential facts.—ED.

More than 28,000,000 mi. have been flown in Europe and the United States to January 1, 1925, in regular scheduled air service, and in six years, more than 51,000,000 lb. have been carried by aircraft over established routes.

Many other interesting facts, based on data obtained on his trip, on a statement by the United States Post Office of the performance of the Air Mail, and on other official information, are presented by the author, who says that they are indicative of the character of research that must be carried out to separate the authentic lessons of experience from the welter of ungrounded opinion. They represent only a beginning in the work of scientific fact finding and, although they are selected facts and hence present only a partial picture, they form a hopeful basis for holding an optimistic view regarding the ultimate future of air transportation.

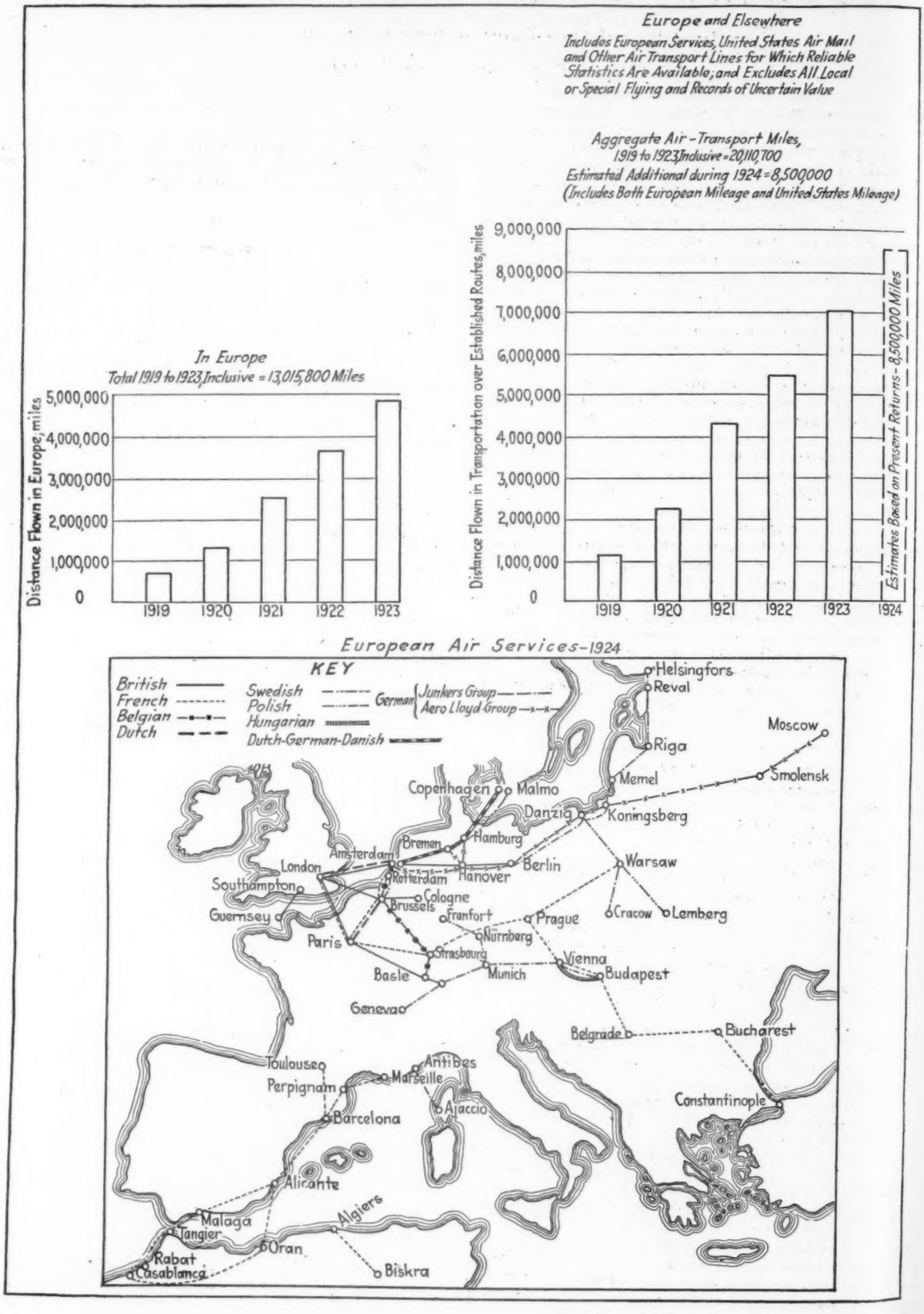
During the five years from 1919 to 1923, inclusive, 121,496 passengers were carried by regular air services and it is estimated that in 1924 the number was 62,000. Only three passengers were killed on the British and Dutch air lines during the three yars 1921 to 1923 in which 7,990,000 passenger-miles were flown. That is an average of 2,663,300 passenger-air miles for each fatality. During the same three years the United States Air Mail transported 4,316,500 lb. of mail, of which only 230 lb. were lost or destroyed. That was an average of one pound lost by air mail in 18,760 lb. as compared with one package of registered mail lost by the Post Office in 1922 in 13,830 packages transported.

Remarkable Air Mail Performance

Out of a total of 30,506 Air Mail trips, of an average length of 203 mi., scheduled during the four years 1920 to 1923, 27 per cent were not started in 1920 or were not completed after starting, 10 per cent were defaulted or uncompleted in 1921, 5.2 per cent in 1922 and only 4.2 in 1923. During the period from June, 1921, to May, 1923, inclusive, the Air Mail, traveling at a minmum ground speed of 70 m.p.h., was on time 85.8 per cent of the trips, whereas the annual on-time performance of the scheduled mail trains at division terminals in New York State during the ten years from 1910 to 1920, at approximately 30 to 35 m.p.h. speed, was 81 per cent. The trains showed a slightly better on-time performance than the planes in the winter, approximately the same regularity in the spring, 12½ per cent less in the summer and 6 per cent less reliability in the autumn.

The greater safety of air transportation compared with land and water transportation is reflected by insurance rates. The express company insurance rate on gold and silver bullion and currency by rail from Washington to New York is 75 cents per $1,000, by bank contract the rate is 10 cents, while the rate by air service from London to Paris is 7½ cents. The rates on fragile articles and other goods by boat and rail, covering all risks, including theft, is 60 cents per $100; excluding theft it is 12½ cents, while by air, covering all risks including theft, it is only 12½ cents per $100.

FIG. 1- MILEAGE FLOWN OVER ESTABLISHED ROUTES CARRYING PASSENGERS, MAIL OR GOODS



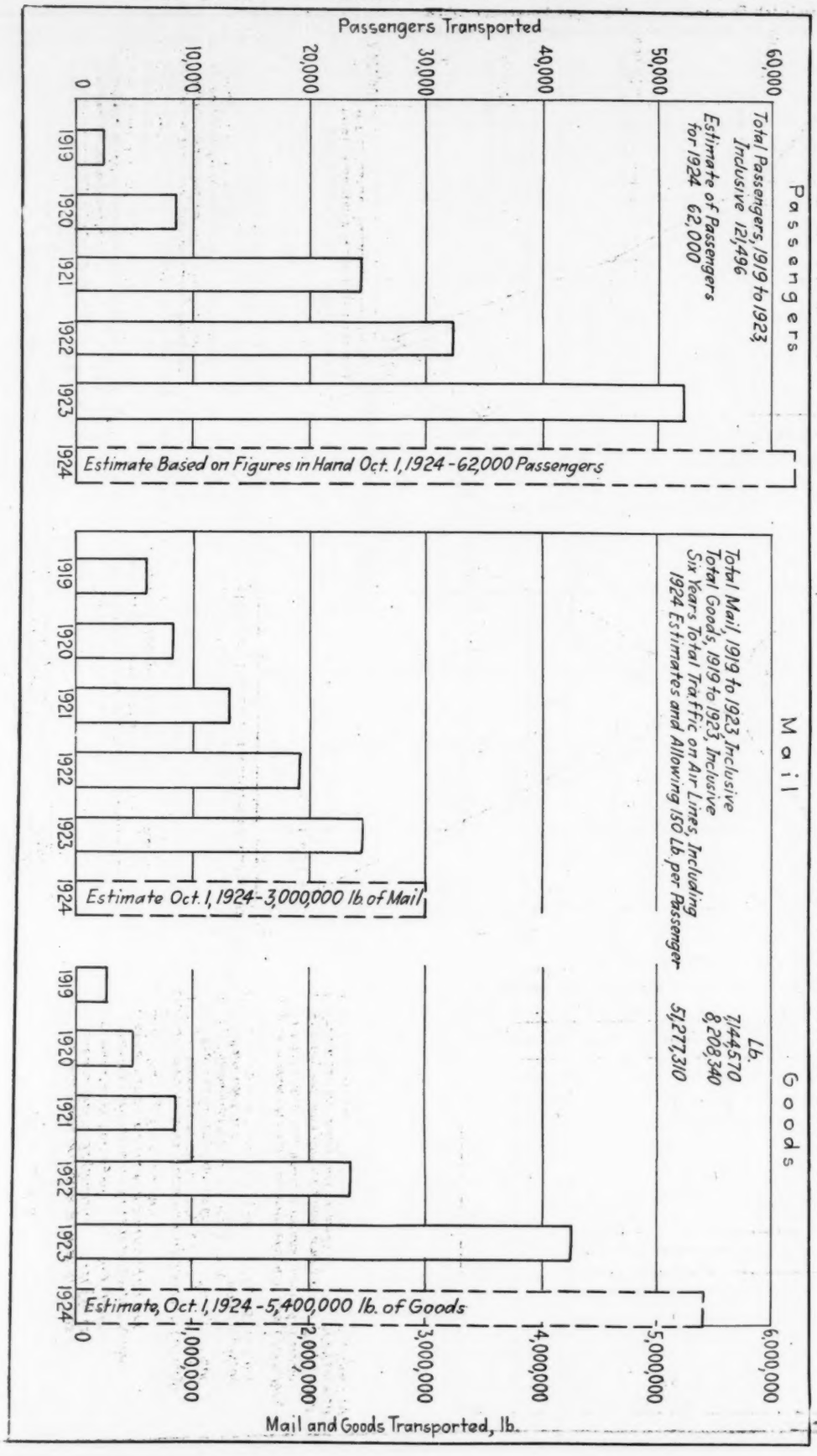


FIG. 2 - PASSENGERS, MAIL AND GOODS CARRIED BY REGULAR AIR TRANSPORTATION SERVICES

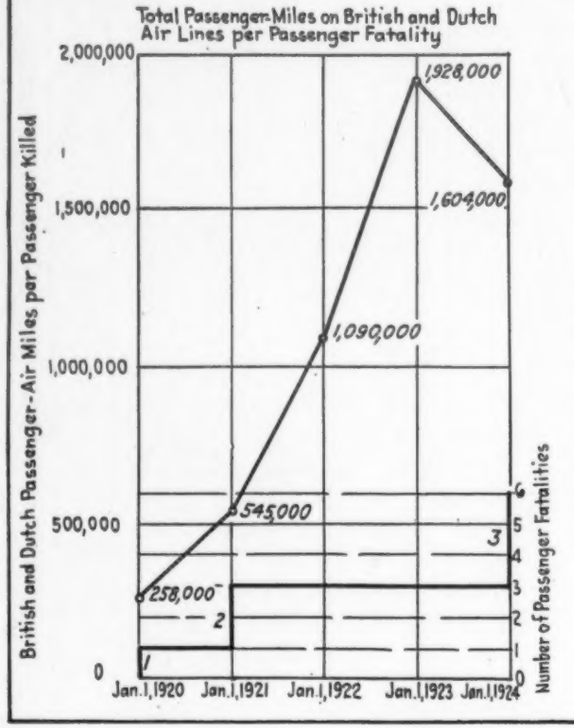
FIG. 3 – EVIDENCE REGARDING THE SAFETY OF PASSENGERS, MAIL AND GOODS CARRIED BY REGULAR AIR TRANSPORTATION SERVICES

Passengers

Passenger-Miles Flown on British and Dutch Air Lines in 3 Years, 1921 to 1923, Inclusive	7,990,000
Passengers Killed	3
Passenger-Air Miles per Passenger Fatality	2,663,300

Compare With:

Passenger-Miles on New York Central Railroad, 1923	2,800,000,000
Passengers Killed or Injured, Excluding Employes and Other Persons	636
Passenger-Train Miles per Passenger Casualty	4,400,000

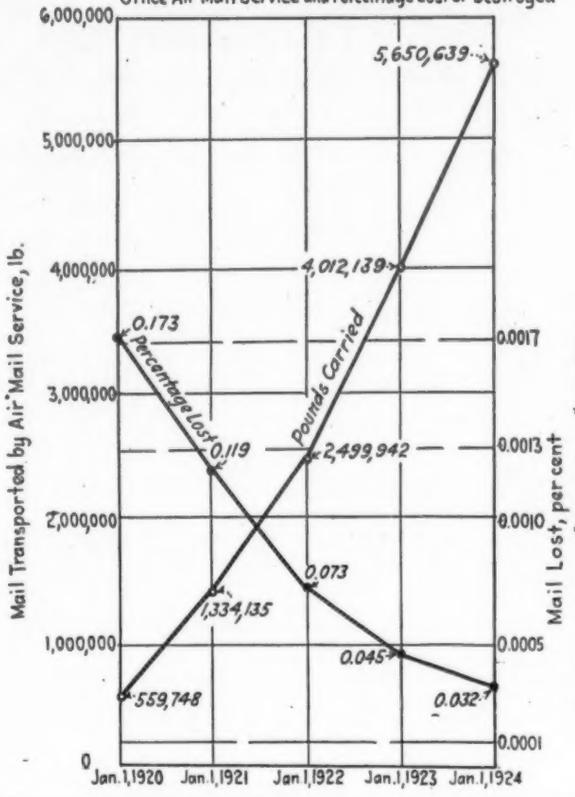


Mail

Mail Transported by Air Mail Service during 3 Years, 1921 to 1923, Inclusive, lb.	4,316,500
Mail Lost or Destroyed, lb.	230
Mail Lost or Destroyed, per cent	0.000053

Compare With:

Registered Packages Handled by United States Post Office Department in 1922	64,981,019
Registered Packages Lost in 1922	4,691
Registered Packages Lost, per cent	0.000075



Goods

Goods Transported by British and Dutch Air Lines in 3 Years, 1921 to 1923, Inclusive	1,991,550 Lb.
Percentage Lost or Damaged	Negligible

A Comparison of Insurance Rates from London to the Continent Indicate That Shipments by Air Are Safer Than by Boat and Rail

Compare Insurance Rates on Gold and Silver Bullion and Currency:

A – City of Washington to New York City, by Train, American Railway Express Co.	$0.75 per $1000
B – City of Washington to New York City, by Train, Bank Contract	$0.10 per $1000
C – London to Paris or Amsterdam, by Air	$0.075 per $1000

Compare Insurance Rates on Fragile Articles, Automobile Parts, Furs, Fashion Goods, etc., between London and Paris or Amsterdam:

D – All Risks, Including Theft, by Boat and Rail	$0.60 per $100
E – Excluding Theft Risks, by Boat and Rail	$0.125 per $100
F – All Risks, Including Theft, by Air	$0.125 per $100

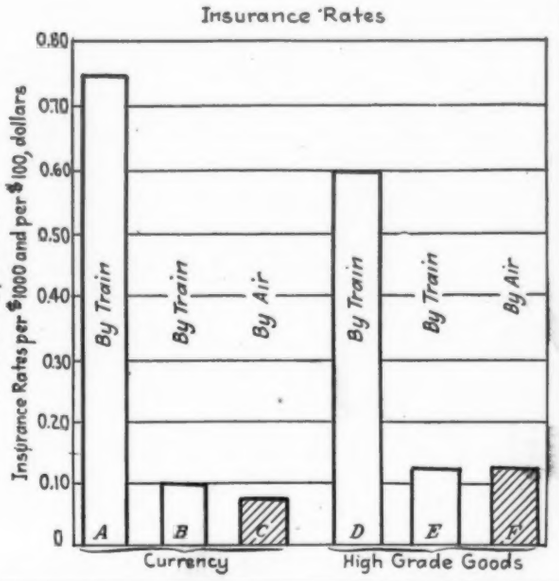
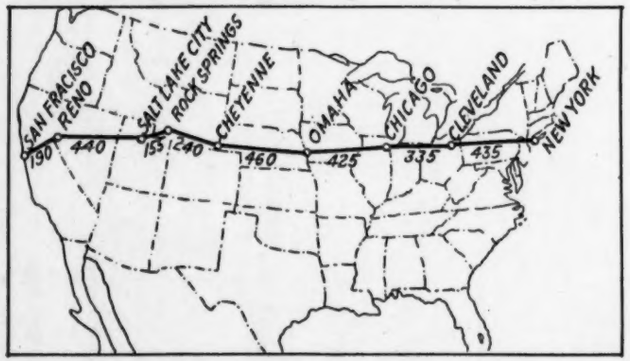
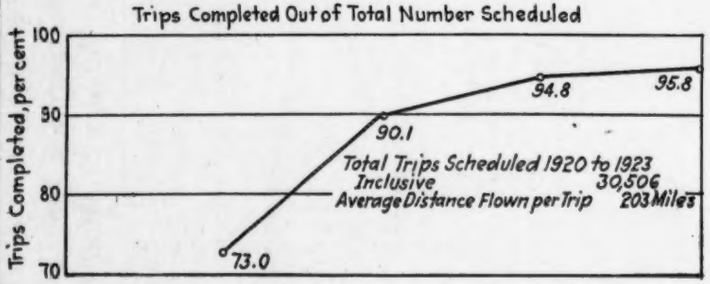
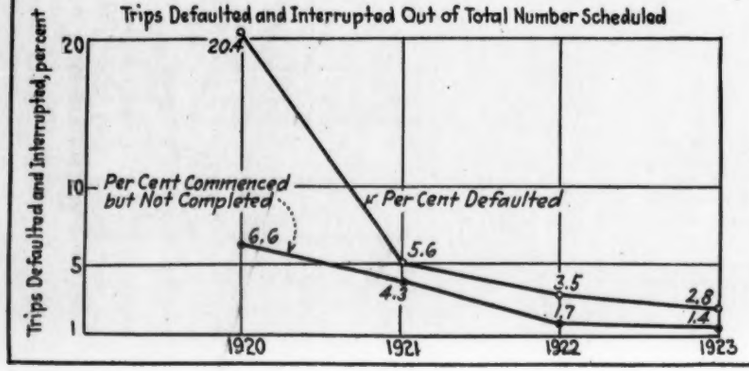


FIG. 4—EVIDENCE REGARDING THE RELIABILITY OF AIR TRANSPORTATION AS SHOWN BY THE PERFORMANCE OF THE AIR MAIL SERVICE



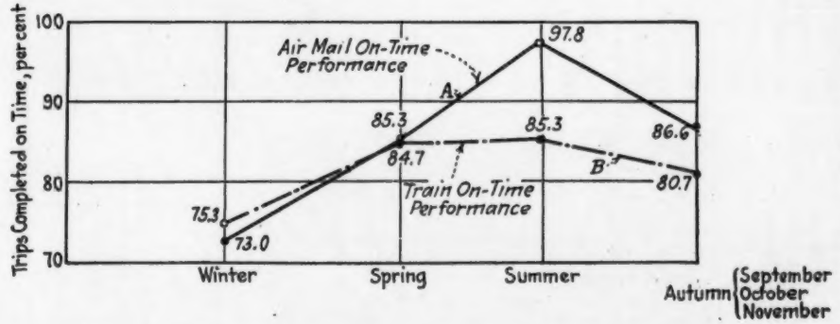




A - Per Cent of Scheduled Air Mail Trips between New York City and Chicago Arriving on Time during 2-Years Operations, June 1921 to May 1923, Inclusive on an 11-Hr. Flight-Time Schedule (Minimum Ground Speed, 70 M.P.H.)

B - Per Cent of Scheduled Trains in New York State Arriving on Time at Division Terminals during 1910-1920, Inclusive

Annual Air Mail On-Time Performance at 70 M.P.H., per cent	85.8
Annual Train On-Time Performance at Approximately 30 to 35 M.P.H., per cent	81.0



Compare Also On-Time Performance between New York City and Chicago of

Pennsylvania Railroad Three Limited Trains (20, 22 and 23-Hr. Schedule) during May 1923, per cent	89.0
New York Central Railroad Five Fastest Trains during 1 Week in June 1923, per cent	84.3
Air Mail on 11-Hr. Flight-Time Schedule during Month of June, 1922 and 1923, per cent	98.1

The Mercury Jr.

An All-Purpose Plane Incorporating Many of the Features of the Successful Mercury Sr. Mail Plane

The Aerial Service Corporation of Hammondsport, N. Y., entered "Mercury Jr.," their latest product, designed by H. C. Mummert, Chief Engineer, for the 1925 New York Air Races. It embodies several features which have made for the good performance, ruggedness, and exceptional reliability of its predecessor, "Mercury Sr.," their 1,000 lb. Mail plane.

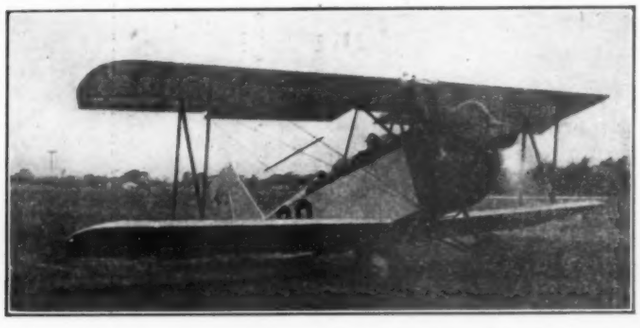
Four Different Models

This is an all-purpose plane, designed for high performance, low initial and maintenance cost. It is fitted in the following types: Mail Plane, 500 lb. pay load; training plane; pilot and two-passenger plane; and camera plane, powered with either Wright J4, 200 h.p. aircooled radial, or C6A, 160 h. p. watercolled engines. For the races it was fitted as a pilot and two-passenger plane and C6A engine as illustrated in photo. For events 2 and 5 it was equipped with a smaller pair of lower wings, with 100 sq. ft. less surface. Performance is listed for each engine installation, as a mail plane type.

The machine is a single bay biplane, with steel tubular center section supporting the streamlined aluminum welded 43 gal. fuel tank, thereby eliminating the usual weight of ribs and covering, the tank serving for both.

Structural Details

The fuselage is of welded steel tubular construction, with quickly removable engine mount of the same construction. The fuselage proper is covered with fabric, while the engine cowling, etc., is of aluminum well streamlined in shape. The pilot's cockpit is unusually roomy, with a folding seat, under which a suit case may be carried. Another case maye be carried under the front seat in the three-seater type. Back



The Mercury Jr., with Curtiss C6A engine.

of the pilot, between the upper trussing and turtle gack, is a roomy luggage compartment, while another is situated in the front cockpit above the extra 40 gal. fuel tank, when such is carried for long flights.

The Undercarriage

Fitted to the fuselage is a new and novel type of split axle landing gear of welded streamline tubing and stub axle, in the form of two triangles, in front view, the apexes of which are tied together below the center of the fuselage with shock absorber cord and pivoting at the lower longerons. The tread is quite wide and on rough landings seems to have unusual snubbing qualities.

The tail skid is of steel tubular construction, with rubber compression disks and maganese steel shoe, while the tail plane is constructed of steel tubing and channels hinged with bronze pins and covered with fabric. Elevator control is inside the fuselage, while the rudder is operated by two "horns."

The wings of box beam, trussed rib, and dural compression strut construction and covered with fabric, are braced with streamlined wires and N struts of streamline steel tubing, the ends of which are adjustable for alignment.

The shuttered radiator for the C6A engine installation is streamlined and supported between the fuselage and center section.

Controls are on ball and taper pin bearings with walking beams for the elevator and a torque tube with crank operating balanced ailrons. Foot pedals with two foot positions operate the rudder. Cables are used throughout. The stick itself is of duralumin, with hard rubber grip.

CHARACTERISTICS

With Wright J4 engine	Capacity 500 lb.
Span	32 ft. 10 in.
Length	21 ft. 6 in.
Height	9 ft. 6 in.
Area (total)	305 sq. ft.
Chord	5 ft.
Gap	6 ft.
Stagger	29.5 in.
Dihedral	2 deg.
Wing section	Clark Y
Mail compartment	25 cu. ft.
Engine	200 hp.
Weight empty	1570 lb.
Useful load	
Pay load (mail)	500 lb.
Gas (3.6 hr. cruising)	300 lb.
Oil	50 lb.
Pilot	170 lb.
Weight full load	2590 lb.
Wing loading	8.5 lb./sq. ft.
Power loading	12.95 lb./hp.
High speed	130 m.p.h.
Landing speed	52.3 m.p.h.
Absolute ceiling	16,100 ft.

With Curtiss C6A the following characteristics differ:

Length	22 ft. 9 in.
Engine	160 hp.
Useful load	880 lb.
Pay load (mail)	400 lb.
Gas (4 hr. cruising)	270 lb.
Oil	40 lb.
Weight, full load	2450 lb.
Wing loading	8.04 lb./sq. ft.
Power loading	15.30 lb./hp.
High speed	120 m.p.h.
Landing speed	50.9 m.p.h.
Absolute ceiling	13,750 ft.

The Rickenbacker Engine

P. & A. Photos

Capt. Rickenbacker and Maj. J. H. Rudolph inspecting the new Rickenbacker commercial airplane engine. The engine is said to weigh less than 175 lb. and is under 30 inches in maximum diameter. Aluminum and duralumin are very extensively used in manufacture of the engine, the crankcase being of an aluminum casting as is also the gear case, while duralumin connecting rods and aluminum alloy pistons complete the light weight structural features of the design.

An Extended Flying Boat Cruise

A most instructive and successful cruise has recently been carried out by No. 480 Coastal Reconnaissance Flying Boat Flight, which is part of the Coastal Area Command, Royal Air Force, and is based at Calshot, Hampshire, England.

The Flight has recently been re-equipped with new twin-engined flying boats of the "Southampton" type, which are built by Messrs. Supermarine Aviation Works, Ltd., of Woolston, Southampton. They are fitted with two 450 hp. Napier Lion engines. The cruise was intended to demonstrate the facility with which modern flying boats can work away from their own base under any weather conditions. The flying boats operated in conjunction with H.M.S. Calliope and two destroyers.

Four "Southampton" flying boats took part in the flight and their itinerary was as follows, the duration of the cruise being from September 3 to September 23, 1925:—

R.A.F. Base Calshot to Portland and thence to Cattewater, Plymouth, Cattewater to Pembroke, where the flying boats secured to moorings and refuelled from the destroyers; Pembroke to Carrickfergus, Belfast Lough. Enroute, an exercise was carried out with part of the fleet. One flying boat was forced to land near Wicklow Head and was taken in tow by H.M.S. Calliope, arriving safely at Carrickfergus the following day. Three flying boats then proceeded to Campbeltown, where exercises were continued. The fourth machine was left behind at Belfast for repairs.

Throughout this period, bad weather was experienced, the wind at times reaching gale force, with rain and low clouds. Visibility at times was reduced to 200 yd., with clouds as low as 100 ft. During a gale on September 15, the three flying boats landed safely at Cambeltown on completion of an exercise, and refuelled from H.M.S. Calliope without any difficulty, while the gale was still at its height. All flying boats handled well on the water and rode well at their moorings.

From September 16 to 22, demonstration flights were carried out.

The planes parted company with the naval forces at Cambleston on September 21, and flew to Belfast, where they remained a day. On the following day, a demonstration formation flight was made by four of the flying boats, and surprise was expressed that the aircraft should have been able to go up, as it was raining and blowing hard and visibility was poor owing to the mist.

The seaplanes left for Calshot on September 23, two making the non-stop flight, a distance of 510 miles, in 5¾ hr; the remaining two flying boats visited ports en route. The total distance covered by the seaplanes during the cruise, was approximately 10,000 miles.

Both cruises have shown that under conditions of weather which must, throughout, be considered distinctly bad, flying boats are capable of keeping the air and carrying out such observations as visibility will permit. What is more important, it demonstrates that a programme once having been drawn up, can be adhered to practically independently of the weather. Refuelling at sea was carried out on all occasions without a hitch, and provided a certain amount of shelter is available when the flying boats are not flying, it has been demonstrated that they can function successfully quite separately and independently of their land bases.

Fine Performances With Lamblin Radiators

Reports continue to come of good performances of planes equipped with Lamblin radiators. Not only were these radiators used on the Supermarine Napier S4 Schneider Cup monoplane which, prior to the Schneider Cup race, set up a world's speed record of 364.924 km.p. (228 m.p.h.), but the recent speed records with a useful load of 500 kgs. made by M. Lasnes, were also carried out with the cooperation of Lamblin radiators.

Etablissements Lamblin also announce that the recent Prague Race held in Europe was won by M. Fritsch, piloting an Avia S.H.2IR airplane fitted with Lamblin radiators, covering the course of 200 km. at 187 m.p.h.

Packard Marine Engines

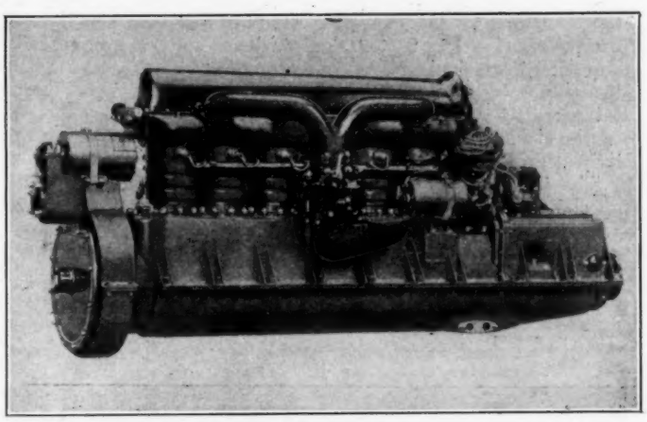
Editor, AVIATION:—

The comments in your Sept. 28 issue under the heading of "Airplane and Motor Boat Races" interested me greatly since I have been involved in both of these types of competition on many occasions, and more especially since I participated in the boat races in question with more fortunate results than some of the other competitors.

I think that the point you have made in asking the indulgence of the public when reviewing air travel based on the short-comings of the motor boat is well taken. However, I feel that I must rise to defend the racing boat powerplant and point out that the failure of the majority of the boats competing in the recent events to complete the race was due not to powerplant failures but due to installation troubles. These troubles were brought about indirectly by the very rapid strides made in airplane engine design recently and with which progress the marine architects have evidently not quite been able to keep pace.

I cite for example the numerous propeller shaft failures and hull disintegrations resulting from the enormously increased power now available to drive these boats.

I am enclosing photographs of our Gold Cup and Sweepstakes engines which secured first and second place in the Gold Cup and Sweepstakes races respectively, and you will note that these engines follow closely the design of our aircraft engines which have been described in your columns, and these engines, of course, went through the race with no mechanical troubles of any kind.



Packard Speed Boat Engine

Summing up, it seems to me that there is urgent need for both the marine architect and airplane designer to study and simplify the installation of power plants which have been developed to a far greater degree than has the so-called "plumbing" of our airplanes and motor boats, failures of which are responsible for by far the greatest majority of forced landings and motor boat breakdowns.

J. G. VINCENT,
Vice President of Engineering, Packard Motor Car Co.

Aviation Insurance

The congress at Lyons, which is dealing with juridical aspects of aviation, has given considerable attention to the question of insurance. The speakers, while bearing in mind the analogy which aerial insurance has with maritime insurance, nevertheless dwelt on the necessity for special conditions. Finally, a text was drawn up embodying the following points:

Article 1.—Aircraft may be insured up to their total value against all risks, with the exception of those intentionally caused by the person insured or by the pilot.

Article 2.—Insured aircraft may be abandoned to the underwriters or assurers in case of damage amounting to three-quarters of the value insured, or in case of loss, after no news has been received for a period of three months.

The importance of aviation insurance is ever increasing and its inclusion in the Lyons Congress is noteworthy.

New Airmail Flood Lights

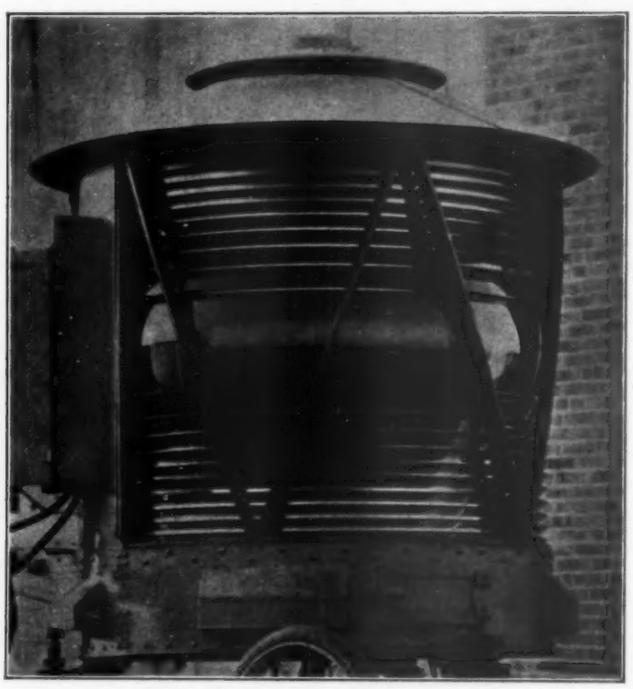
20,000 *Candle Power Incandescent Lamp Gives* 500 *Million Candle Power Flood Illumination*

RECENTLY a new lighthouse for aircraft, projecting a beam of one billion candle power, was erected by the B.B.T. Company on Mount Afrique near Dijon, France, making this the largest aerial lighthouse in the world. It is intended for the guidance of airmen on the route between Paris and Algiers. At a height of 500 ft., it will be visible as far away as the British Coast, Brussels, Frankfort-on-the-Mann and Milan, or about 300 mi. It is one of a series of such lights to be built for the European airways, and the B.B.T. Company started its construction in 1918 to insure the return of French night-bombing squadrons during the war but the armistice delayed completion.

U. S. Air Mail Flood Lights

The same principle is used for the B.B.T. dioptric 500 million candle power air mail flood lights which are used on the New York to San Francisco Air Mail Service. The light is composed of a large ground glass lens, built up of twenty-one dioptric elements of circular dimensions, so that it throws the light in a radius of 180 degrees. The lens is contained in a heavy steel water-proof casing in which are mounted the electrical connections and mechanism for operating the light source.

The light source consists of either a 20,000 candle power special incandescent lamp, which may be run off a 100 or 110 volt circuit or a standard automatic arc. The whole is mounted, when desired, on an adjustable chassis, the light itself being mounted in three adjustable tripods so that the angle of beam may be adjusted by hand. The projected light covers an area of approximately one half mile, while the intensity is such that a book or newspaper may be read within a distance



The 500 Million Candle Power Airport Flood Light

of from two to three miles from the light. When in operation it is claimed to be distinctly visible from the air at distances from sixty to seventy-five miles.

In addition to the great intensity of the light and the even illumination of the area, another feature is that the light beam is absolutely controllable at all times and may be kept at any desired level above the ground or turned in any direction. Aircraft may land or depart with the use of this

Le Bourget Airport, the air terminal of Paris, is shown in the above two pictures both by day and by night. The splendid flood illumination given out by the half billion candle power light which can be seen standing on the field on the right hand side fully depicted in the lower picture.

light without danger of blindness to the eyes of the operators. Its construction is sturdy and simple and the life of the equipment without noticeable depreciation is estimated at from twenty-five to fifty years.

With regard to depreciation of the light itself, if it is kept in good condition, it should last for a number of years. The lens, being of the finest hand ground St. Gobain glass, does not cloud with age or develop other imperfections which would decrease the efficiency of the light. Some of the lenses of this type which were supplied to the Bureau of Lighthouses fifty or sixty years ago are still in good condition after continual use and exposure. This is one of the advantages of using the finest ground glass in the world, ordinary glass becoming cloudy or developing cracks or bubbles after being in service for only a few years.

Another feature of the light is the fact that it may be used to illuminate the surface of large areas of water without reflecting the bottom of the area, as beams of light are confined strictly to the surface of the water illuminated.

World Records

CLASS C (Airplanes)

Returning to point of departure without refueling.

Duration (France) Drouhin and Landry, Farman biplane, Farman 450 hp., at Etampes-Chartres, Aug. 7-8-9, 1925: 45 hr. 11 min. 59 sec.

Former Duration Record (France) Coupet and Drouhin, Farman Goliath, Farman 450 hp., at Toussus, July 16-17, 1924: 37 hr. 59 min. 10 sec.

Distance (France) Drouhin and Landry, Farman biplane, Farman 450 hp. at Etampes-Chartres, Aug. 7-8-9, 1925: 4400 km., 2734 mi.

Former Distance Record (United States) Lieutenants Kelly and Macready, U.S.A., T2 Liberty 375 hp. at Wilbur Wright Field, Dayton, Ohio, April 16-17, 1923: 4050 km., 2516.55 mi.

Unreliable Engines Check Light Plane Development

Some time ago, AVIATION *received a letter from a light plane enthusiast, painting, in glowing terms, the performances of these little planes. A reply was sent, pointing out that, in spite of the splendid theoretical performances, the light plane did not seem to be gaining greatly in popularity and asked the reason. The subject is of interest and the following letter throws some light on it.*—ED.

Editor, AVIATION:—

You ask, "What, in your opinion, is the trouble, and why have the records established not developed into anything practical?"

If we look back to the early days of flying we will find that the engine problem was the chief factor which the pioneers had to contend with. Cross country flights were few and far between.

It is a big step from the old four cylinder Wright to the Curtiss D12, and it took twenty years to accomplish it.

While it will not take ten years to achieve equal results in the light plane class, nevertheless, it will take time to evolve a motor which will be to the light plane what the Curtiss, Wright, Packard and Liberty motors are to the big planes of to-day. Judging by the results of the New York light plane events, I would say, that the engine merits seventy-five per cent of the praise or blame for the success or failure of the plane.

One engine, the Bristol "Cherub," took everything. It was the only engine especially built for light plane work and it proved conclusively that motor cycle engines, however well adapted to the work of light planes, are, nevertheless, not thoroughbreds.

All honor is due Professor Powell for his very efficient machine, but it is not any detraction to say, that if the Johnson plane were equipped with a Bristol "Cherub," the races would have been much more interesting.

The "Pander" has made some very creditable cross country flights, notably from Holland to Spain and to England. This machine is fitted with a 25 hp. Anzani engine, an old reliable engine, but it surely comes within the light plane class.

There has, as yet, been no ruling as to what constitutes a light plane. In the Round Germany Competition, 40 hp. was the maximum for Class A,—the light plane class. In France, 45 hp. is considered in the light plane class and in England the limitation has been by limiting the piston displacement to 1,100 cu. cm.

In the 1926 competition, however, the limitation imposed is a maximum engine weight of 170 lb. With this weight limit, engines developing 70 hp. can be built. Nevertheless, this weight limit excludes the 60 hp. Cirrus, a very reliable engine which weighs 260 lb.

Sixty horsepower seems to be regarded by the British Air Ministry as the maximum for light planes and certainly very successful machines can be built around an engine of this power.

The Wright "Gale," which did so well in the Round Germany competition, in Class B, is a power plant which could well be used for a primary training plane.

From what I have written, you will see that, in my opinion, the trouble with light plane development is the lack of a suitable motor.

Perhaps some of our engine manufacturers will turn their attention to the needs of the light plane builders and give us a good reliable engine which will not cost a fortune.

DENIS F. CASHMAN

A Paddle Driven Light Plane

Relative to discussions on man power in flying, it is of interest to note that German lightplane enthusiasts have recently given this matter some consideration, with the result that a design has been evolved from an airplane incorporating this principle. The Poralla-Beuthen, under which name the machine is known, is a parasol monoplane type, in which the pilot is accommodated in a prone position in the fuselage. Immediately in the rear of the wing and not only extending almost to the wing tips but also filling over half the gap between the wing and the tail plane is a structure of paddle wheels which are rotated by the pilot with his feet, operating through cranked pedals. The vanes of the paddle wheels are, in effect, small chord high aspect ratio airfoils arranged at such an angle to the radius of rotation that, when rotated clockwise, the normal direction, the upper surface of each vane in succession is presented normally to the air and, driving this back just as a normal paddle wheel, the airplane is propelled along. On the other hand, however, over the upper part of the periphery of the paddles, the angle at which the vanes are set enables them to approach the air at a comparatively small angle of attack, which of course continually decreases as the vanes rotate, and their resistance is considerably reduced, they, in fact, actually contributing, in small measure, to the lifting function of the wings of the plane.

No details are available as to the flying qualities of the machine and it would seem that prolonged flight under man power would, in any case, be very much limited. However, the design is interesting from an experimental point of view and may even have some utility in gliding and soaring flight in supplementing the use of up-currents.

Just what horse power a man can develop and under what conditions he can deliver maximum output is a very debateable question but that it is possible, with favorable gearing arrangements, to develop as much as ½ hp. or even ¾ hp. seems likely and, while experiments along these lines applied to flying would seem to have no possible future whatsoever, they, nevertheless, possess an interesting experimental value.

Air Mail Financial Report

The following is a report of operating expenses for the United States Air Mail Service for the month of July, 1925.

EXPENSE		PERCENTAGE
Maintenance of Way		
Fields	$ 9,737.55	
Lights	20,962.38	
Communication	9,393.41	
Motor Vehicle	3,621.44	
	$ 43,714.78	.1699
Maintenance of Equipment		
Rebuilding Planes	$ 44,454.98	
Rebuilding Motors	5,166.30	
Repairing Field Equipment	1,279.89	
Warehouse	3,655.03	
	$ 54,556.20	.2121
Transportation		
Pilots' base and mileage pay and Expense Accounts	$ 27,204.75	
Gasoline	4,081.88	
Oil	110.01	
Forced landings	126.70	
	$ 31,523.34	.1226
Executive Overhead		
Gen. Supt's Office	$ 5,394.42	
Div. Supts' Offices	4,129.04	
Superintendent of Repairs	2,045.00	
	$ 12,368.46	.0481
CAPITAL		
New Buildings	$104,010.75	
New Lighting Equipment	5,596.86	
Ground Improvements	1,168.91	
New Flying Equipment	3,300.00	
New Miscellaneous Equipment	993.15	
	$115,064.67	.4473
GRAND TOTAL	$257,227.45	1.000
REVENUE (EXCESS POSTAGE)	$ 75,746.51	
Cost per mile transportation for July	$ 0.1353	
Amount expended per mile flown in July	$ 1.1046	
Miles flown in July (day)	158,121	
(night)	74,739	
(total mileage)	232,860	

Maintenance of Way.

Expenditures under fields includes rent, fuel, salaries of office force, travel expense and mileage scrip.

Expenditures under lights includes salaries of caretakers, rent on emergency fields and miscellaneous lighting equipment.

Expenditures under communication includes telephone, telegraph, radio supplies, salaries and travel expense of radio operators.

Expenditures under motor vehicles includes gasoline and oil, and miscellaneous equipment for motor vehicles, and salaries of chauffeurs and auto mechanics.

Maintenance of Equipment

Expenditures under rebuilding ships includes wages of aeroplane mechanics and helpers and miscellaneous aeroplane equipment.

Expenditures under rebuilding motors includes wages of motor mechanics and helpers and miscellaneous equipment.

Expenditures under warehouse includes warehouse employees and stock clerks' wages.

AIRPORTS AND AIRWAYS

Greater Kansas City

By Bob Burtt

Public interest has never been greater than it is here at present. The prospect of the Fokker factory locating here, the passing through of the Ford Reliability Tour, the coming aviation demonstration at Fairfax Field, Nov. 11, have all helped to stimulate an interest that dwarfs anything seen yet.

The local boys are all hopped up over the advent of the air mail, The National Air Transport, which Paul Henderson is papa of. The raison d'etre for all this excitement is the local field to be used, North Kansas City Field. The boys at Richards say that its settled that the mail will land there. The Kansas City, Kansas people are preparing to handle the crowds that will watch the air mail land at Fairfax and the rest of the non-partizans are looking forward to seeing the mail swoop down gracefully into the East River Bottoms, that municipal-field-to-be which the Realtors are sponsoring. Meanwhile, we'll wait for Paul to come along in his flivver and tell us where the mail is to land.

The icy breath of Boreas has not dimmed the arder nor the activity of the Richards Field flyers. Headed by Tex LaGrone, the well known Methusaleh of Aviation, they are carrying merrily on. There is one thing certain—they are selling the public at Richards. Larger crowds keep coming every Sunday, in fact, it is not unusual to have a crowd of 4000. One pleasing feature of this is that the same people ride over and over again. One complaint is heard among the boys flying new Wacos and Swallows. They tear their hair; they say that the dumb public would just as soon ride in Standards aas in their ships; they implore the heavens for an enlightening sign as to the reason for this phenomenon. I nailed a Standard passenger after he had come down from his trip last Sunday and asked him how he happened to pick out the ship he did, for his flight? "Why, it's a Standard, isn't it?" he asked. "Yes", I replied with a blank stare. "I thought that Standards were the best planes made," he continued, "they're tried and true. They stand the gaff. They call them Standards because they are the standard for all the rest of the ships." Tex, by the way, flew back from the Pulitzer Races in a new Waco, in weather that knocked the boys for a loop back in those mean Pennsylvania mountains. Tex doesn't use this for a selling talk on the merits of Wacos, much! The Fairfax Airport Co. have disposed of their interest in the 8 passenger Cabin Waco to the other owner, Mrs. Sabra M. Carter. Basil Simms had his first crack-up since he learned to fly this summer. Those noble Standards will slip off if you pull 'em up to steep, Bass!

The Pierce Field boys, over in the wilds of Argentine, are keeping the pleasant drone in the ears of the natives over their way. There are seven ships on the field at present. Fairfax Field, blest by cross country pilots on account of its visible location at the junction of the Missouri and Kaw rivers, is giving the public their customary popular rides. A truly beautiful view can be had of both cities on even the shortest ride from this field. People appreciate the saving in time in getting to this field. It is 12 min. from K.C., Mo., and 5 min. from K.C., Kan. There are four ships there at present, Fairfax Airport Co.'s LS5 and Laird; Fred Kane's Standard, and Bert Falconer's Standard. Jack Lowderman

HISTORY OF AERONAUTICS By E. C. VIVIAN

We have a few copies left of the above.

The retail price is $3.00, with the first ten new or renewal orders, $2.50 with subscription. This work is divided into four parts: The Evolution of The Aeroplane; Progress in Design; Aerostatics; Engine Development. There are 521 pages with numerous illustrations of photographs and diagrams.

Gardner Publishing Co., 225 Fourth Ave., New York, N. Y.

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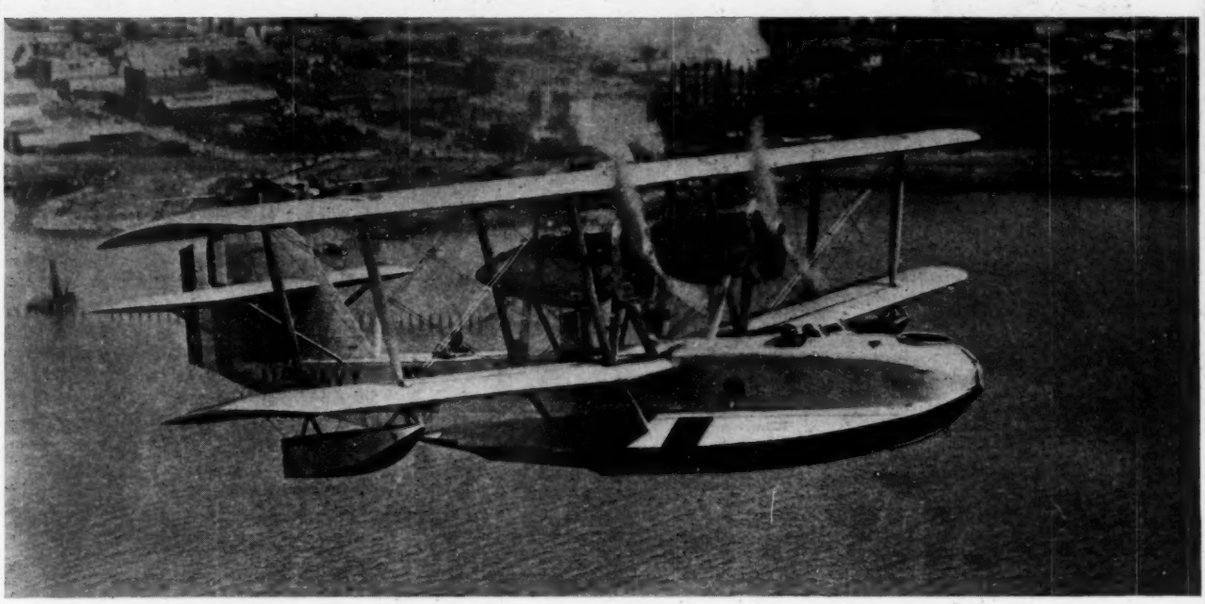
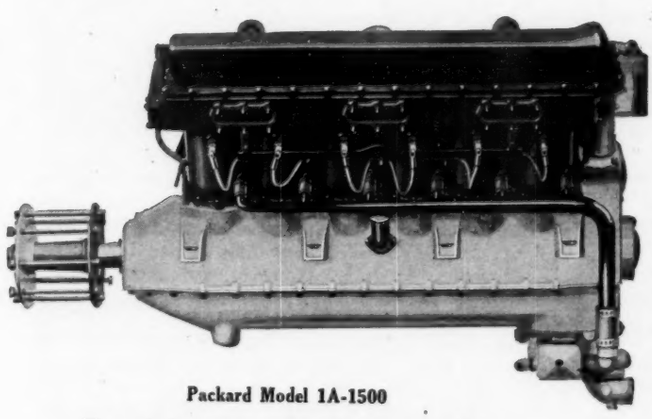


Endurance !

- a new seaplane record for distance flown over water



Packard Model 1A-1500

Two of these motors formed the power plant of the PN-9 No. 1 on its record making flight to Hawaii. The motors have a bore of 5 3-8 in., a stroke of 5 1-2 in., a displacement of 1500 cu. in., and develop 500 b.h.p. at 2000 r.p.m. Their weight is 720 lb.—but 1.44 lb. per effective hp.

ON the recent flight of the PN-9 No. 1 to Hawaii, Packard aircraft motors again set a new world's record—for distance flown over water. When the PN-9 No. 1 was forced down for lack of fuel, 2116 statute miles had been covered—a distance greater by 1122 statute miles than any other seaplane ever covered in a flight across the ocean. "The engines worked perfectly," reported Commander John Rodgers in commenting on the flight. Additional proof of the endurance and reliability of Packard Motors under all conditions was furnished after the plane arrived at Honolulu. The wings were repaired, and the seaplane flown for four hours with full load.

PACKARD MOTOR CAR COMPANY

Detroit, Michigan

ASK THE MAN WHO OWNS ONE

is out barnstorming in Kansas. It is rumored that he has been waiting for favorable weather to come back. Better take a leaf out of Tex's book, Jack!

Foxboro's Flying Salesman

Commercial aviation grows apace. The Foxboro Co., Inc., indicating and recording instrument makers, of Foxboro, Mass., have Mr. W. C. Brown, a former pilot in the air service, for their Tulsa district manager. The end of his active service, however, was not the end of Mr. Brown's flying. He bought a K-6 Standard and determined to do flying for a hobby. Since he has been interested in aviation for more than twelve years, this was not altogether surprising.

Mr. W. C. Brown, the flying salesman, with his 1924 Waco plane. Note the briefcase lying on the wing.

Because of the topographical conditions around Oklahoma, Kansas and adjacent states, it was early decided to use the plane for business. Great distances and poor train schedules soon meant nothing to the Tulsa Office. All-day trips were made in a few hours and, instead of the Manager being kept out of the office for two days when his help is needed, he hops in his Waco in the morning and generally returns before sunset, even if the prospect does live 300 miles or more from Tulsa. The commercial value of this is easily understood by anyone doing business in these days of heavy competition. Of course, the Foxboro Company allows Mr. Brown the same mileage rate for plane travel as it does to its other salesmen, who use automobiles.

Mr. Brown does not make anything but dignified entrances or exits. He has been seen to come down between rows of tanks at a refinery and taxi right up to the door of the superintendent's office. He takes off from the same place. The oil men get lots of fun watching this 'flying salesman' dodging oil derricks as he comes to earth on a newly opened oil field. So far, his army air training has kept him 100 per cent whole and not even his wife expects him to spoil his record.

The K-6 Standard was worn out and a Longren purchased. When that was finished, a 1924 Waco was on the job. Early in the year, he bought a 1925 Waco, which he is now flying. Mr. Brown is a reserve officer, attached to the 320th Observation Squadron, 8th Corps Area.

From a commercial standpoint, this 'flying salesman' idea has proved itself feasible. Given a man like Brown, who can fly, and likes the air enough to own a plane, everything goes well. More calls can be made and a greater area covered from a given central point, all at a saving of time and money. The time of a man fit to be a district manager, is worth saving, and out West, it is a simple matter for the plane to be used for such work.

Rodger's Fleet

The group of flying boats now commonly known as 'Rodger's Fleet' again put in their appearance at Baltimore this year. The 'fleet' was on its annual migration from the North to the South and this is probably the largest group of commercial planes which has made the flight from New York to Florida and proves that the flying boat is not extinct along our Eastern coast.

Harry Rodgers, who has been operating 'boats' for many years, is the 'Admiral' of the fleet. George Cobb, Eddie Niehmier, George Rummell and Bill Regan are flying the other planes. The passengers on the trip South are Maj. M. K. Lee, Gerald Lee, W. Stafford, W. Adcock, Mr. Winkie and Miss Ruth Nichols. Miss Nichols, who is New York's only lady aviatrix, was dressed in a leopard skin coat and riding boots and looked very fetching.

George Cob, who joined the fleet this summer, was formerly with the Aeromarine Airways but turned to raising chickens when that organization disbanded. Unfortunately George's chicken house burned down and he is now in the flying game again.

The planes used are Curtiss Seagulls using C6 and K6 motors. The hulls have been altered so as to carry three passengers besides the pilot and the boats handle well with this load. The fliers scatter during the summer and operate from two main bases, one in Long Island and the other at Lake George. This fall Rodgers and Cobb flew up to the Bear Lake Gun and Rod Club in Canada with M. K. Lee and Paul Stevens, who were desirous of getting a moose. Headquarters for the party were at Trout Lake some 140 miles N. W. of the Ottawa river. From there the party flew into to various neighboring lakes where there were supposed to be moose. On the first evening Cobb went out with a guide who called a great bull moose out of the bushes only a short distance away from the camp. Cobb took two shots and the moose walked slowly back into the bushes. Later Cobb learned that it was a stuffed moose which runs on a track and comes out to visit all the newcomers to the camp.

The Stirling Expedition to New Guinea

The First American expedition to venture into the unexplored wilds of Dutch New Guinea, left Yackey's Checkerboard Field, Forest Park, Ill., Tuesday, October 20th, 1925, at 2:35 p.m., flying in a Yackey transport for San Francisco, where they will meet the leader, Mr. M. B. Stirling, who, for years, was assistant curator in the department of Enthology in the National Museum at Washington, D.C. It is the purpose of the scientists to gather data and specimens for the National Museums, as well as to make a thorough study of the land and the race of pigmies, about which there has been much speculation but little concrete information. It is known that the pigmies are a very ancient people and because of the inaccessibility of that part of the island in which they live, they are still as primitive in their lives as they were in their earliest history.

The Dutch government was first applied to for the necessary permission to enter but this was greeted with an emphatic "NO", but, after much persuasion, the expedition was finally permitted but was told that there would be no protection and no responsibility assumed for the safety of the party, as control of the head-hunting cannibals, which infest the country, was almost impossible. However, the party, with much joy but with serious thought, started on their quest for a reliable airplane for the journey. After looking around for several months, they finally decided that a Yackey Transport was the plane for them, because it had low landing speed and a high service ceiling. The party had to travel over a 14,000 ft. mountain to gain their objective and make the trip twice a week to their base with a full load of 2000 pounds of instruments and food.

The Yackey Transport is fully equipped with a frigidaire cooling system, radio, self-starter and pontoons, to be put on when the party reaches Batavia, Java. It is equipped with a 400 Liberty 12 engine, weighs 2390 lb. empty, will carry a useful load of 2400 lb., and has a low landing speed of 32 m.p.h. with a high speed of 132 m.p.h., and a service ceiling of 23,000 ft. The wing area is 52.7 sq. ft. and climb 11470 ft. in 11 min. 35 sec.

In addition to Mr. Stirling, whose home is in Berkeley, Cal., the exploring party, al of whom are under 30 years of age, consists of Mr. R. K. Peck, St. Petersberg, Fla., photograph-

er; Standley A. Hedberg, Chicago, Ill, historian; H. H. Hoite, Maywood, Ill., who has been our pilot for over five years and has flown hundreds of hours both day and night work here for us; and A. E. (Prince) Hamer, chief mechanic, who worked in this capacity for us for years, is from Colfax, Iowa; Mr. Peck is also a reserve pilot.

According to available scientific information only one previous expedition has had any degree of success whatever in their efforts to explore this particular section of the island, due to the density of the jungle, the hostility of the native and the unfavorable tropical conditions which they met. The Stirling Expedition plans to eliminate these difficulties by flying over the jungles to the interior, where the pigmies are well secluded from civilization in the foothills of the mountains.

According to the plans announced when the plane flew off, the Expedition will leave San Francisco and sail for Batavia, Java, and ship the airplane. The regular mail route will be followed to San Francisco.

Dutch New Guinea is one of the largest islands in the world. It is approximately 1500 miles long and from 300 to 600 miles wide. One half of the island is owned by the Netherlands Government and one half by the British Government.

The plane has a gasoline capacity of 150 gal., enough for 7 hr. of flying at top speed. The wings are especially constructed and doped to withstand the radical weather conditions through which the plane will have to fly.

Emergency Landing Field Near Anacostia

The commanding officer of the United States Naval Air Station, Anacostia, D.C., reports that there is an excellent emergency landing field on the Maryland shore of the Potomac River, 8¾ miles westward of the airline course from Anacostia to Hampton Roads, Va., and 16 nautical miles up the river from Point Lookout. The field is smooth, long, and narrow, being nearly ¾ mile in length and about 300ft. wide at one end and 150 ft. at the other. One end is at the junction of the Potomac River and Blake Creek, midway between Piney Point and Higgins Point. The field is divided down the center by a road, the best half being to the westward.

There is a house and telephone at the north end of the field and trees at the south end. The field is about 15 ft. above the river, covered with grass, has excellent drainage, and is safe for landing any season of the year. Prevailing winds are up and down the field. Approx. position: 38° 12′ 30″ N., 76° 34′ 15″ W.

New Airplane Engine

An aero engine without sparking plugs, magneto, coil, or high tension leads, has been constructed and will shortly be tested in the air. Successful ground tests have been made already.

The engine is the result of extensive experiments at the Royal Aircraft establishment, Farnborough, England, with a system of compression-ignition. A special apparatus injects heavy oil into the cylinders at the correct moment. The oil vaporizes, and is subjected to such an intense pressure that it ignites automatically.

The engine is less complicated than the ordinary aeroplane engine, and it promises a marked reduction in aircraft running expenses.

The Lawson Aircraft Company

According to report The Lawson Aircraft Company of New York has leased the factory at Berckman Street and North Avenue, formerly owned by the Standard Aero Company, and after alterations will engage in the manufacture of aircraft for the United States and foreign Governments as well as for commercial air lines and private individuals. Alfred W. Lawson is the chief designer. The location of an airport as a terminal will be decided upon soon. The Standard Aero Company used the plant during the World War.

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Fort Leavenworth Students View Aerial Demonstration

The annual demonstration flight left Kelly Field, Texas, September 29th for Fort Leavenworth, led by Major Carlyle H. Wash and Captain A. B. McDaniel. This flight, which has become an annual affair, is for the purpose of demonstrating to the students of the Command and General Staff courses at Fort Leavenworth some of the technical possibilities of an Air Service and an Air Force. This demonstration will be repeated this year for the first time at the Cavalry School at Fort Riley. The flight consisted of six Headquarters and Staff planes, six pursuit, six bombardment, one observation and nine attack planes. An explanation of the small representation of observation aviation is the fact that planes and personnel for the demonstration of latest developments in aerial photography and communications will be sent from Chanute and McCook Fields to join the expedition at Fort Leavenworth. Upon the completion of their work at Fort Leavenworth and Fort Riley, many of the pilots and all of the 3rd Attack Group, proceeded to the Air Races at Mitchel Field and participated in the Air Force Demonstration held there immediately following the Races.

Kelly Field Pilots Fly to Pacific Coast

A flight of four airplanes from Kelly Field, piloted by Captain B. S. Wright, 1st Lieut. John P. Richter, 2nd. Lieut. J. S. Griffith and Sgt. Travis recently completed a successful trip to the Pacific Coast and up through San Francisco, Cal., Portland and Pendleton, Ore., and Spokane, Wash., and participated in a series of exhibitions sponsored by the Commanding General of the 9th Corps. Area. The personnel report a successful trip and splendid hospitality at all stops.

Shipments by Air From Middletown Air Intermediate Depot

A total of 2808 lb. of miscellaneous spare parts and supplies were shipped by air from the Middletown Air Intermediate Depot during the months of July, August and September. Of this total, 2600 lb were shipped in Martin Bombers in five trips, the loads comprising 425, 395, 280, 680 and 820 lb., respectively, thus demonstrating the utility of the Martin Bomber in the matter of transporting supplies. Of the remaining 208 lb. of supplies, 200 were carried in DH4B's.

Night Flying in the Philippine Islands

Night flying, using DH4B's and Martin Bombers, was the feature of the air work recently performed by the 28th Bombardment Squadron stationed at Camp Nichols, Rizal, P.I. Lieut. Delmar H. Dunton, A. A. Kessler and H. P. Rush acted as instructors in checking off the various pilots and in night formation and tactical maneuvers. This work was carried out with the new landing light equipment, field light sets being installed only for use in case of failure of the flying

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This is the advice of one of the largest dealers in aircraft parts and supplies, who understands advertising and uses it consistently to expand his business. In a letter of September 28, to AVIATION, this advertiser (name upon request), after telling how, by the key system, he has proven the exceptional advantages of AVIATION advertising, continues as follows:

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equipment. The Martin landings were apparently as good as those made in daylight. The night landings in DH4B's were slightly more difficult, but no trouble has yet been experienced. Lieuts. Myers, Skanse, O'Connor, Gross and Snavely soled on Martins while Captains Beam, Eagle, Lieuts. Harper, Powers and Landers flew DH's at night

Army Air Orders

First Lt. Earle G. Harper, A.S., upon completion of tour of for. serv. to Kelly Field.

First Lt. Byron E. Gates, A.S., Kelly Field, to San Francisco, sailing Jan. 27 for Philippine Is.

Spec. Or. 131, relieving First Lt. Albert J. Clayton, A.S., from assignment and duty A.S. Bal. & Airs. Sch., Scott Field, and directing Lt. Clayton to proceed to Langley Field, revoked. Lt. Clayton to report to Com. Off. Scott Field.

Capt. Frank H. Pritchard, A.S., McCook Field, to Selfridge Field.

Major General Mason M. Patrick reappointed Chief of A.S. for four years beginning Oct. 5, 1925.

Major H. A. Strauss designated as Asst. Commandant, Air Service Balloon and Airship School, Scott Field, Ill.

Vice 1st Lt. V. V. Holland relieved as Asst. Com. Air Serv. Bal. & Air. Sch., Scott Field.

First Lieut. Clinton F. Woolsey to Captain with rank.

First Lieut. Frederick Wieners to San Antonio Air Intermeassigned to McCook Field.

First. Lieut. Ward F. Robinson, Maxwell Field, to Pope Field, Fort Bragg.

First. Lieut. Benj. F. Griffin, Marshall Field, to Anglum, Mo.

First Lieut. Fred C. Nelson relieved as Instructor, Missouri National Guard, and assigned to duty at Marshall Field.

First Lieuts. David R. Stinson, Richard K. LeBrou, Frank L. Cook and Edward H. Wood relieved from assignment and duty with Industrial War Plans Section, Middletown Air Intermediate Depot, and to report to the C.O. of that depot for duty.

Second Lieut. Frederick Wieners to San Antonio Air Intermediate Depot.

First Lieut. F. O. Carroll relieved from Kelly Field and assigned to Mc Cook Field.

First Lieut. James E. Adams assigned to Pope Field, upon completion of tour of foreign serv.

First Lieut. Byron T. Burt, Jr., Langley Field, to Walter Reed Hospital for observation and treatment.

Capt. Gilbert T. Collar relieved Kelly Field and assigned to Organized Reserves, Third Corps Area, Harrisburg, Pa.

First Lieut. Edward E. Hildreth, Phillips Field, to Chanute Field for course of instruction in communications.

Second Lieut. Victor E. Showalter to Scott Field, Ill.

First Lieut. Hubert E. Willson to Chanute Field, Ill.

Second Lieut. Donovan R. Berlin to Chanute Field.

Capt. Louis McComas Young and 2nd Lt. Frederick E. Flader, to McCook Field, O.

Lieut. Col. Harry C. Fry, Jr., Major John H. Larned, Capt. Edgar R. Thiess, 1st Lieuts. Wm. F. Gerhardt, Jesse S. Joseph, Glenn R. Lassiter, Louis R. MacDonough and Stratford D. Mills to Office Chief of Air Service.

Second Lieut. Roland C. Barrett and 1st Lieut. Walter M. Moore, to Office Chief of Air Service.

Capts. Charles O. Dost, Arthur W. Duckstein and 2nd. Lt. John J. Kelly to Mitchel Field.

Major Wm. H. Garrison, Jr., to active duty to Langley Field, Va.

Second Lieut. Harvey M. Cronk to McCook Field, O.

New Ambulance Plane Received at France Field

The Cox-Klemin XA-1 type machine, the very latest word in ambulance aircraft, was on exhibition recently at Albrook Field, Balboa. There are only two planes of this type now in operation, the other one being at Dayton, Ohio. Capt. Andrew W. Smith, Flight Surgeon, Air Service, brought this plane over to Albrook Field from France Field, carrying as passengers Major MacDonald, Provost Marshall; Staff Sgt. Walter J. Cullinane and Private De Vine.

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Get your order in on any of the above within 10 days and I will fly it to you. Complete flying instruction $100.00 to purchasers of planes only.

1-150 H.P. new copper tip Hisso prop $35.00. 1-150 copper tip slightly used Hisso prop $30.00. 1-150 untipped slightly used Hisso prop $15.00. 1 Standard radiator, good condition $15.00. 2-26 x 3 wheels with tires and tubes $5.00 each. 2 sets J.N.4.D. fuselage fittings with nose plates $90.00 for both sets. One set slightly used Hisso valves $8.00. 1 lot Standard landing and flying wires $20.00. 2 Standard ailerons, fair condition $5.00 each. Canuck elevators and rudder $5.00 each.

1 O.X.5. motor completely overhauled with new valve action $225.00. 1-350 H.P. Renault motor, good as new $600.00. 1-4 with order, balance C.O.D,

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A group of spectators showed keen interest in the ambulance plane which Captain Smith demonstrated. Dr. Alfonso Preciado, Supt. of the Santo Tomas Hospital and Dr. Augusto B. Boyd, Chief of the Clinic, were among those who examined the plane and praised its facilities for carrying patients in the utmost of comfort. The crowd was rather surprised when Captain Smith climbed into the big white plane and, without having to crank it by twisting the propeller, started it off as one starts an automobile—by stepping on the self-starter. With his three passengers aboard he left Albrook Field and 25 minutes later landed at France Field.

The plane had a speed of 120 m.p.h. while carrying two patients and an attendant, in addition to the pilot. It is equipped with latest facilities for caring for and attending the sick and injured. This is the first time that an ambulance has been assigned to air forces of the Canal Zone, though it has long been felt that some means of modern conveyance was urgently needed, as, during the past few years, many urgent emergency demands have been made upon the authorities at France Field to rush airplanes to some remote place in the Republic of Panama for the purpose of administering first aid or conveying persons on point of death to the Ancon Hospital where, in many cases, the patient arrived just in time.

U. S. NAVAL AVIATION

A Recent Flight of the TC-4

The Airship TC-4 made a special cross-country flight to Elizabeth City, N.C., for the purpose of participating in ceremonies incident to the opening of the new hard road through North Carolina. Leaving Langley Field at 11:30 a.m., the flight was made to Elizabeth City in one hour. The ship stood by at low altitudes until 1:00 p.m., when it cruised over the city and water front, giving persons on the ground an opportunity to see it, until 1:30 p.m., when it headed toward Langley Field, arriving at the hangar at 3:00 o'clock. The crew were Lieut. Col. Ira F. Fravel, Capt. Charles P. Clark and 1st Lieut. W. J. Read, pilots; Staff Sgt. George A. Triplett, radio operator; Tech. Sergeant Chester H. Johnson, engineer; and Sergeant John Vischovich, rigger.

On Oct. 5th Col. T. A. Baldwin with Lieut. R. Kieburtz took the TC-4 for routine training flights. Weather in the morning was good for flying, with a wind velocity of not more than 12 m.p.h., but about 11:10 a. m. a strong cross hangar wind came up and the situation became rather serious. The TC-4 was brought to the ground and a good landing was made in spite of the wind. Every available man on the company area was called out and, after a real struggle in a near gale of 37 m.p.h., the ship was taken into the hangar. The only damage sustained in the half hour fight with the storm was the loss of a pontoon.

Navy Airmen Have Crack Eleven

The Pensacola Naval Air Station football team, which will play the Paris Island Marines on November 26, has an eleven, its supporters think, equal to the Station team of last year, noted for inflicting a 14-13 defeat on the Ft. Benning President's Cup team.

The team this year has a number of former Naval Academy stars, including "Eddie" Cruise, who received All-American mention three times, and Hamilton. Among the promising enlisted players are King, who plays center, and Wrezenski, a three-letter athlete at the Station, having won awards in baseball, basketball and football.

The coaches this year are Lt. Comdr. A. H. Douglas, acting in an advisory capacity; Lts. H. M. Martin, assistant field coach, and La Rue Lawbaugh, field coach. Lieutenant Lawbaugh is noted for his success in coaching ship's teams.

Navy Air Orders

Lt. (jg) Warren K. Berner det. Airef. Sqdns., Battle Fleet, to U.S.S. Nevada.

Lt. (jg) Howard L. Jennings det. Airef. Sqdns., Battle Fleet, to Arizona.

Lt. (jg) Herbert W. Taylor det. Aircf. Sqdns., Sctg. Flt., to Nav. A. Sta., Anacostia.

Ens. Frederick J. Nelson det. Nav. A. Sta., Pensacola, to U.S.S. West Virginia.

Lt. George T. Dill det. Nav. A. Sta., Pensacola, Fla., to U.S.S. Aroostook.

Lt. (jg) John P. Womble det. Nav. A. Sta., Pensacola, to temp. duty Edgewood arsenal.

Lt. Winfield S. Cunningham det. Nav. A. Sta., Pensacola, to Aircf. Sqdns., Sctg. Flt.

Lt. James B. Sykes det. Nav. Air Sta., Pensacola, to Aircf. Sqdns., Sctg. Flt.

Lt. (jg) Roy A. Darron det. Nav. A. Sta., Pensacola, to Aircf. Sqdns., Battle Flt.

Lt. (jg) Roland P. Kauffman det. Nav. A. Sta., Pensacola, to Aircf. Sqdns., Sctg. Flt.

Lt. (jg) Thomas G. Murrell det. Nav. A. Sta., Pensacola, to U.S.S. Cincinnati

Lt. (jg) John L. Pratt det. Nav. A. Sta., Pensacola, to Aircf. Sqdns., Sctg. Flt.

Ens. Marcel E. A. Quinn det. U.S.S. Sloat to continue U. S.S. Shirk.

Lt. John A. Terhune det. Nav. A. Sta., Pensacola, to U. S. S. Mexico.

Lt. Clifford M. Alvord det. Nav. A. Sta., Pensacola, to U. S.S. Reno.

Lt. (jg) Mellish M. Lindsay det. Nav. A. Sta., Pensacola, to U.S.S. Langley.

Lt. (jg) Harry T Smith det. Nav. A. Sta., Pensacola, to U.S.S. Hannibal.

Lt. (jg) Walter F. Weidner det. Nav. A. Sta., Pensacola, to U.S.S. S-1.

Ens. Harry R. Carson det. Nav. A. Sta., Pensacola, to U. S.S. West Virginia.

Ens. James C. Guillot det. Nav. A. Sta., Pensacola to U. S.S. Farquhar.

Ens. John D. Shaw det. Nav. A. Sta., Pensacola to U.S.S. Henshaw.

Lt. Ralph L. Lovejoy det. Nav. A. Sta., Pensacola, to Nav. Sta., Key West.

Hydroplane for Atlantic Crossing

An "oceanplace," a new device for water travel, patterned after the sea flea, which jumps from wave to wave, is being completed by Count de Hasenko, Russian engineer, under the sponsorship of the French Government.

The Count, who was formerly Ukrainian Minister in Berne and Bucharest, plans to test his craft in a voyage from Marseilles to Rio de Janeiro, with his German police dog "Lob" as his only companion. He hopes to complete the trip in eight days, whereas the regular steamer schedule between these ports is eighteen days.

Count de Hasenko's queer device consists of an enclosed shell, hanging from two airplane wings, with long, freely-moving stabilizers, resembling legs, suspended below. At the end of these are boat-like "feet" filled with helium.

These draw only three inches of water when the apparatus is at rest and merely touch the waves as the plane skims along, supported by its wings and driven at about ninety-five miles an hour by an airplane propeller. The whole apparatus weighs a ton.

The inventor intends to make the South American trip in four stages, stopping at Oran, Algeria; Dakar, Senegal, and Natal, Brazil.

Determination and Classification of the Aerodynamic Properties of Wing Sections

This note, prepared by Max M. Munk for the National Advisory Committee for Aeronautics, contains remarks on the possible improvement of the experimental determination of the aerodynamic properties of wing sections. It shows how errors of observation can subsequently be partially eliminated, and how the computation of the maxima or minima of aerodynamic characteristics can be much improved.

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PUBLISHER'S NEWS LETTER

In referring to the annual election of the N.A.A., it was suggested that probably neither General Patrick's nor General Mitchell's ideas would receive much support from the new officials whose training was so predominatingly naval. The following letter from Godfrey L. Cabot, President of the N.A.A. puts the association in a new light in its efforts to make "America first in the air." It assumes that the N.A.A. will not take sides on military matters. We have asked General Clarence R. Edwards, as suggested by President Cabot to send us his views on a Department of Defense. Gen. Edwards, it will be remembered, has recently been interested in promoting an airship company in Boston. Mr. Cabot's letter follows:

"Referring to your very interesting News Letter on page 567 of your issue of October 19, I beg to say that to the best of my knowledge and belief the National Aeronautic Association has never opposed any measure put forward by General Patrick. General Patrick is a very strong advocate of a Department of National Defense, but he does not consider the control of civil aeronautics essential to this plan.

"The National Aeronautic Association is not committed either for or against this proposition, and in my judgment it is very unlikely to take sides on it in the near future for the reason that the matter is essentially military and involves immense complications of military administration, as to which our Governors are in general not experts.

"Personally, I must admit that this proposition seems inherently logical and reasonable, but involves a colossal task. Can you not induce General Clarence R. Edwards to discuss it in your columns? He was strongly urging such a department something like ten years ago and I suppose is still in favor of it, and I feel sure that a discussion by a man of such ability and command of English would be of great interest to your readers and myself among the number."

* * * *

We have received from Major Leslie MacDill of McCook Field, a letter in which he states that he has "taken the trouble to clip pertinent passages and inclose them for your reference. It's awfully hard to be consistent, is it not?" The inclosure is a parallel column underscored account of the Liberty Engine Builder's Race and the Mitchell Trophy race appearing in AVIATION after the Pulitzer Race. And the best part of the sarcasm is that Major MacDill is undoubtedly right. It is hard to be consistent, especially when races are delayed and in the short time before going to press, there is not ample time to make the comparisons that Major MacDill's letter has prompted.

The point he evidently makes is that we explained the disappointing time made in the Pulitzer Trophy race by an examination of the time made over previous courses by PW-8, and the time made by similar types this year. So that our technical friends at McCook Field may have their side put in a proper light, it should be stated that at St. Louis where a speed of 139.03 m.p.h., was made in the Liberty Engine Builder's Race there were only six laps flown. Last year at Dayton the course was 180 miles with twelve laps and the speed made by the DH's was 130.34 m.p.h. This year the course was 180 miles with fifteen laps and the best time made by any American entry was 128.3 m.p.h. It would, therefore, appear that with more turns and on a windy day the course at New York was much slower than at the other cities. Another point should also be made in view of the reconsideration suggested by Major MacDill. The official speed for the Douglas XO-2, 151 m.p.h., was made on a short straightaway, and therefore our comparison with the 128.3 m.p.h., made in the race was not one that gives a proper parallel. It would appear from the results of the race, that, considering the number of turns of the course and the weather, the Douglas corps observation plane's speed was not lower comparatively than that made by other types under the adverse conditions prevailing. We are very glad that Major MacDill brought this matter to our attention and that our readers are given a clearer interpretation of this year's race.

* * * *

Next week, Cy Caldwell will continue to regale our readers with his first attempt at an illustrated historical narrative. He has, after much laborious research, prepared a most detailed study of those aeronautical appendages, the Modocks, and anyone who is interested in backgrounds, precedents and forerunners will find in this study, which will always be used for reference purposes, facts, and perhaps fancies, that will be enlightening as well as entertaining.

Cy's "Whence the Modocks" takes them from their humble but vociferous origin in the African bush, where they evidently needed no wine to stimulate speech, and traces them down through the ages to the climax of their activity—the present. Whatever may be the opinion of some long-faced brethren about a serious publication, such as AVIATION has tried to be, adding to the gayety of airmen by little side trips into humor, it has been the unanimous opinion of those from whom we have heard that "Cy's description of the Ford Reliability Tour and his "Seen Through the Bayonets" were masterpieces. As the bill boards say—"Wait for 'Whence the Modocks.' "—L.D.G.

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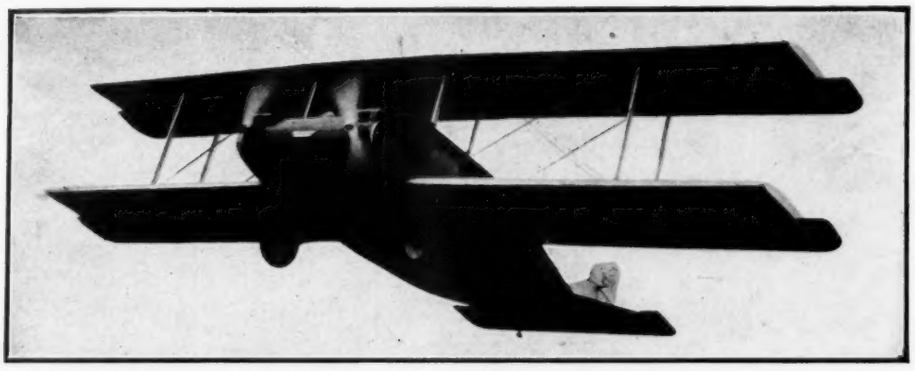

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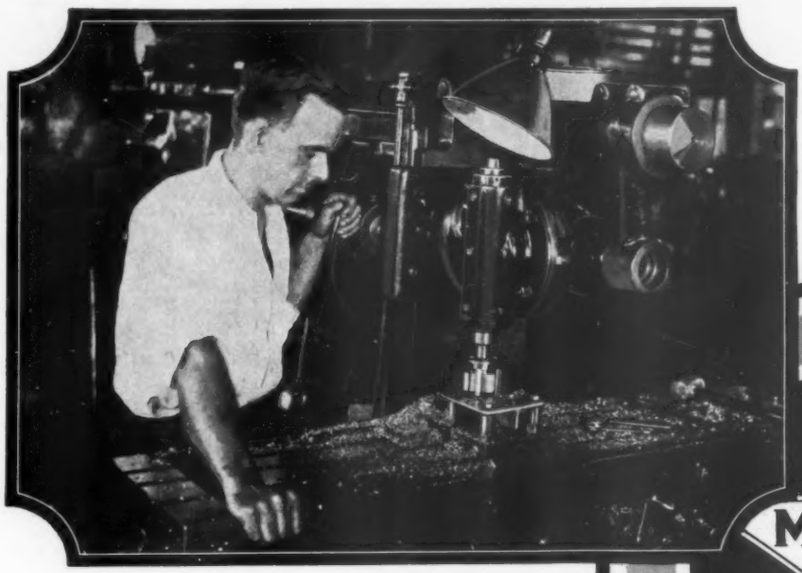

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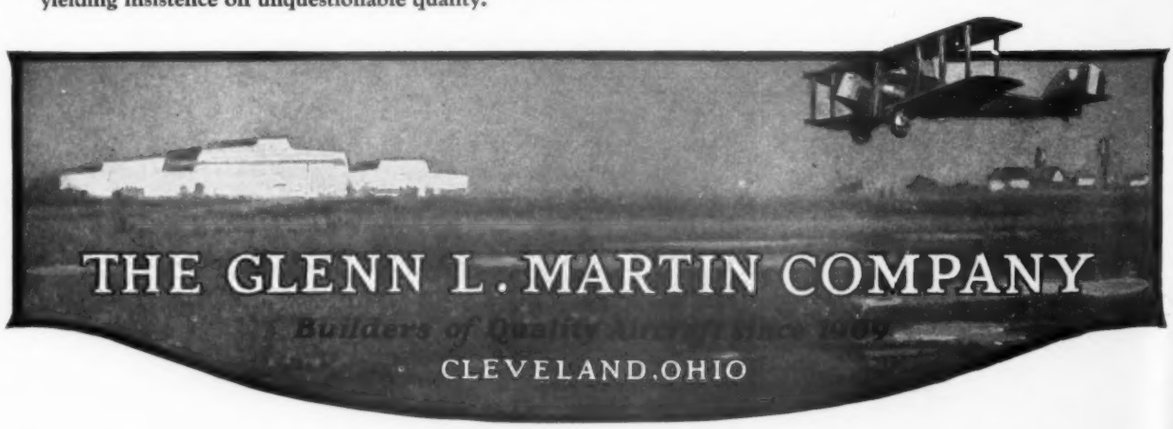

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